

SUMMARIES OF MICHIGAN PAVEMENT SKID RESISTANCE
1968 Test Program

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MICHIGAN DEPARTMENT OF STATE HIGHWAYS



**SUMMARIES OF MICHIGAN PAVEMENT SKID RESISTANCE
1968 Test Program**

**Physical Research Unit
Research Laboratory Section
Testing and Research Division
Research Project 54 G-74
Research Report No. R-704**

**State of Michigan
Department of State Highways
Lansing, August 1969**

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LEGEND

Direction of Test Vehicle

NB, SB, EB, WB etc. = Northbound, Southbound, etc.

Lane Tested (noted following direction of test vehicle)

RT	=	right turn lane	3 or 2 = third or second lane from
OL	=	outer lane	centerline or median
CL	=	center lane	
IL	=	inner lane	
LT	=	left turn lane	
D	=	deceleration lane	

Surface Type

BA	=	bituminous aggregate
BC	=	bituminous concrete
CONC	=	portland cement concrete
NSST	=	non-skid surface treatment
SA	=	sand asphalt
ST	=	surface treatment

SUMMARIES OF MICHIGAN PAVEMENT SKID RESISTANCE 1968 Test Program

The annual reporting procedure for skid resistance testing as initiated in 1965 is continued in this report, which summarizes the nearly 9,700 skid tests conducted during calendar 1968 test year. The report includes the following five sections:

1. Conventional Concrete and Bituminous Pavements
2. Friction Levels Determined After a Five-Year Service Period
3. Experimental Features in Pavement Surfaces
4. High-Accident Locations
5. Special Request Tests

Item 2 is a new section, added to the report this year for the first time. In this section, all projects which have had earlier data reported will be re-tested after a five-year service period and data will be given in future reports.

Explanatory remarks are presented at the beginning of each section as a preface to the tabulated data for that category of pavement testing. Of these categories, all Special Request tests and all High-Accident Location tests have been previously reported to interested agencies within the Department.

All skid test values are expressed as 40-mph coefficients of wet sliding friction (wsf). A wsf value of 0.40 is generally considered the dividing point between "satisfactory" and "unsatisfactory" pavement surfaces and it has been arbitrarily defined as the "Departmental Safety Standard." Surfaces with coefficient values of 0.35 to 0.40 are in a "transitional" or "questionable" range. Projects below 0.35 could be dangerous under wet conditions, depending on prevailing speeds, road alignment, and geometrics. Surfaces with coefficients of 0.20 or less are as slippery as packed snow.¹ Reference should be made to Research Report No. R-585 ("Summaries of Michigan Pavement Skid Resistance: 1965 Test Program") for information regarding operation of the skid-test device, selection of test areas, and verification retests.

¹ Moyer, Ralph A., "A Review of the Variables Affecting Pavement Slipperiness," Proceedings of First International Skid Prevention Conference, 1959.

SECTION I
CONVENTIONAL CONCRETE AND BITUMINOUS PAVEMENTS

Table 1 -- Concrete Pavements Constructed in 1966, 1967, and 1968

1966 Construction

Initial skid tests were conducted during the second year of service on 19 projects constructed in 1966 and comprising 80 lanes of roadway (112.7 lane miles). Friction levels ranged from 0.24 to 0.68 and averaged 0.45. Two lanes, representing 1.6 percent of the total lane mileage, yielded average wsf values below 0.30. Average values of 0.27 and 0.29 were obtained respectively on the WBOL of U 63052A, C18 and the WB#3 lane of U 82062-010. Wsf values ranging from 0.30 to 0.39 were also determined on 22 lanes which represent 19 percent of the total lane miles tested.

1967 Construction

Coefficients determined on 1967 concrete pavement construction ranged from 0.35 to 0.70 and averaged 0.50. Only three of the 52 lanes tested this year produced average coefficients below the Departmental Safety Standard of 0.40. The average friction level on the WBOL of Project F 06041-001 was 0.37. The level obtained on the SBIL and NBOL of F 79032-001 was 0.38 and 0.39, respectively. These three lanes represent 1.4 percent of the 171 lane miles (13 projects) tested.

1968 Construction

Eighteen lanes of seven concrete pavement projects (68.6 lane miles), constructed in 1968, were tested in their initial year of service. All lanes yielded values above the Departmental Safety Standard, with values ranging from 0.40 to 0.63 and averaging 0.52.

Table 2 -- Bituminous Concrete 4.12 Constructed in 1966, 1967, and 1968

1966 Construction

Ten 1966 bituminous concrete (BC) projects were tested this year after two years service. Wsf values range from 0.32 to 0.59 and averaged 0.45 for the 37 lanes tested (51.0 lane miles). Seven lanes, representing 25.7 percent of the total lane miles tested, yielded coefficients averaging lower than the 0.40 Departmental Safety Standard. The average coefficients on these seven lanes range from 0.35 to 0.39 and are categorized as being in the transitional area between a safe and unsafe friction level.

1967 Construction

Following a one-year service period, 22 bituminous concrete projects constructed in 1967 were tested and the friction levels obtained ranged from 0.31 to 0.64 and averaged 0.47 for the 72 lanes (212.0 lane miles) involved. Eleven percent of the lane miles tested (11 lanes) averaged below the Departmental Safety Standard.

1968 Construction

Initial skid tests were conducted on 26, 1968 bituminous concrete projects consisting of 82 lanes (264.8 lane miles). Coefficients ranged from 0.31 to 0.68 and averaged 0.47. Averaging below the Departmental Safety Standard were 23.2 percent of the lane miles tested (11 lanes). However, bituminous concrete projects for the 1968 test year--tested during their first year of service--show an increase of 12 percent over initial values of the same surface-type tested in 1967.

Table 3 -- Bituminous Aggregate 4.11 Constructed in 1966, 1967, and 1968

1966 Construction

One 1966 bituminous aggregate project (BA), consisting of two lanes (14.4 lane miles) was tested during the 1968 season. This project exhibited excellent skid resistant qualities with wsf values ranging from 0.64 to 0.67 and averaging 0.66.

1967 Construction

Sixteen 1967 bituminous aggregate projects comprising 34 lanes (169.5 lane miles) were tested during 1968, following a one-year service period. Coefficients of friction range from 0.33 to 0.71 and average 0.49 with less than two percent of the total lane miles falling below the Departmental Safety Standard.

1968 Construction

Initial skid tests were conducted on eleven 1968 bituminous aggregate projects consisting of 31 lanes (192.8 lane miles) during this test year. Coefficients obtained ranged from 0.21 to 0.58 and averaged 0.40. Averaging below 0.40 were 48.6 percent of the lane miles (15 of 31 lanes). Friction level determined on five lanes, representing 14.4 percent of the total lane miles, was below 0.30. Construction projects associated with these lanes

were Mb 18022-006, F 22012-002 and Mb 24051-002. Data were reported for appropriate corrective action through the special request phase of the skid resistance study (see Table 24).

Table 4 -- Miscellaneous Bituminous Surfaces Constructed in 1967 and 1968

Stone-Filled Sand Asphalt

1967 Construction

Five stone-filled sand asphalt surface course projects were tested after a one-year period of service. Wsf values ranged from 0.42 to 0.64 and averaged 0.50 for the 12 lanes (38.7 lane miles) represented by this service type. All coefficients determined were above the Departmental Safety Standard.

1968 Construction

Tested during the initial service year were two projects representing eight lanes (15.1 lane miles) of stone-filled sand asphalt surface course. Lanes on the US 2 portion of Mb 49023-009, representing 36.4 percent of this surface's lane miles, yielded wsf values of 0.32 and 0.33. The remaining 54.6 percent of the lane miles exhibited friction levels ranging from 0.40 to 0.46 and averaging 0.42.

Special Hot Emulsion Wearing Course

1967 Construction

Special hot emulsion sand mix surface courses were applied on two 1967 construction projects that were tested this season, following a one-year service period. Wsf values range from 0.48 to 0.59 and average 0.51 for four lanes (9.2 lane miles) representing this surface type. Additional coefficients for project Mb 38061-008 are reported under 1968 construction and also as 68 SR-6 in Table 24.

1968 Construction

Two special hot emulsion sand mix surface course projects were constructed and tested in 1968. For the six lanes (27.3 lane miles) wsf values range from 0.43 to 0.56 and average 0.48. Additional information for project Mb 38061-008 is contained in the preceding paragraph and also as 68 SR-6 in Table 24.

Non-Skid Surface Treatment (Single Seal)

1967 Construction

Two single seal NSST projects, representing six lanes (62.4 lane miles) were tested after a one-year service period. Wsf coefficients obtained averaged 0.55, well above the Departmental Safety Standard and ranged from 0.49 to 0.63.

Non-Skid Surface Treatment (Double Seal)

1967 Construction

Project Ms 21024-008, representing two lanes (3.4 lane miles) of double seal non-skid surface treatment, was tested after its first year of service. Friction level was extremely low with coefficients ranging from 0.16 to 0.28 and averaging 0.22. Because of the potentially hazardous surface condition on this project, wsf values were reported to the Bureau of Engineering for appropriate corrective action.

Bituminous Non-Skid Resurfacing

1968 Construction

A single, bituminous non-skid resurfacing project, constructed in 1968, was tested this year. Coefficients range from 0.58 to 0.62 and average 0.60, thus exhibiting outstanding skid resistance qualities for the four lanes (3.1 lane miles) involved.

TABLE 1
CONCRETE PAVEMENTS CONSTRUCTED IN 1966, 1967 and 1968

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction							
			Coarse	Fine		Low	High	Avg					
U 38083A, C4	M 50 - US 127B from Blackstone St E & SE to Intersection of Columbus St & Mich Ave. Also from Water St N to Mich Ave	Eisenhour Const. Co., Inc.	30-35	30-35	WBOL	0.37	0.43	0.40					
					WPCL	0.26	0.41	0.39					
					WBIL	0.36	0.39	0.37					
U 60051E, C25	US 25 (SB) from Gratiot Ave to Wells St	Anderson & Ruzzin, Inc.	E. C. Levy, Dix	50-1 & 50-41	SBOL	0.40	0.44	0.42					
					SBCL	0.41	0.43	0.42					
					SBIL	0.44	0.47	0.46					
BI 50111G, C75 I 82025H, C47	194 from S of 8 Mile Rd N to 10 Mile Rd	Eisenhour Const. Co., Inc.	E. C. Levy, Dix	50-41	NBOL	0.40	0.42	0.41					
					NBCL	0.44	0.49	0.47					
					NBIL	0.44	0.49	0.47					
					SBOL	0.34	0.39	0.36					
					SBCL	0.39	0.40	0.40					
BI 50111G, C74	194 from 10 Mile Rd N to 12 Mile Rd	Eisenhour Const. Co., Inc.	E. C. Levy, Dix	50-41	NBOL	0.36	0.42	0.40					
					NBCL	0.44	0.46	0.45					
					NBIL	0.54	0.58	0.56					
					SBOL	0.38	0.41	0.39					
					SBCL	0.43	0.47	0.45					
BI 50111G, C75	194 from 12 Mile Rd N to 14 Mile Rd	Eisenhour Const. Co., Inc.	E. C. Levy, Dix	50-41	NBOL	0.37	0.42	0.39					
					NBCL	0.42	0.45	0.44					
					NBIL	0.56	0.64	0.60					
					SBOL	0.38	0.44	0.41					
					SBCL	0.50	0.54	0.52					
U 63031A, C16 U 82053A, C38	US 24 from S of Oakland-Wayne Co. Line to N of Oakland-Wayne Co. Line	Cooke Contracting Co.	E. C. Levy, Dix	62-55	NBOL	0.34	0.39	0.37					
					NB#3	0.42	0.44	0.43					
					NB#2	0.35	0.38	0.38					
					NBIL	0.36	0.37	0.38					
					SBOL	0.35	0.41	0.38					
U 63052A, C18	M 24 from Telegraph Bd E to Woodward Ave	Cooke Contracting Co.	63-4	63-4	EBOL	0.28	0.33	0.30					
					EBCL	0.33	0.37	0.34					
					EBIL	0.41	0.48	0.45					
					WBOL	0.24	0.29	0.27					
					WBCL	0.30	0.34	0.32					
					WBIL	0.36	0.38	0.37					
					I 63174B, C61	175 from 6th St N to Sprague St	Cooke Contracting Co.	E. C. Levy, Dix	82-5 & 50-41	NBOL	0.38	0.44	0.42
										NBCL	0.39	0.40	0.39
										NBIL	0.50	0.56	0.53
										SBOL	0.37	0.38	0.38
SBCL	0.45	0.47	0.46										
I 63174A, C66	175 from Bernhard St N to Manatee St	Cooke Contracting Co.	E. C. Levy, Dix	50-41	NBOL	0.53	0.55	0.54					
					NB#3	0.40	0.48	0.43					
					NB#2	0.50	0.54	0.53					
					NBIL	0.49	0.51	0.50					
					SBOL	0.47	0.54	0.50					
F 77023A, C2	M 21 reloc. from E of Barth Rd E to near Michigan Rd	Denton Construction Co.	75-5 & 71-47	50-26	EBOL	0.52	0.57	0.55					
					EBIL	0.63	0.68	0.66					
					WBOL	0.48	0.51	0.49					
					WBIL	0.60	0.61	0.61					
					U 77023P, C9	M 21 reloc. from 40th St E to M 146	Eisenhour Const. Co., Inc.	75-5	50-26	EBOL	0.48	0.51	0.49
EBIL	0.50	0.54	0.51										
WBOL	0.50	0.54	0.53										
WBIL	0.51	0.55	0.53										
U 77023D, C10	M 21 reloc. (EB) from M 146 E to US 25	Eisenhour Const. Co., Inc.	75-5	50-26						EBOL	Not Tested Parking Lane		
					EBCL	0.48	0.51	0.50					
					EBIL	0.46	0.47	0.47					
U 82062-010*	US 12 from W of Haigh St W to E of US 24 (WB only)	Thompson-McCully Co.	63-7	63-7	WBOL	0.33	0.35	0.34					
					WB#3	0.29	0.30	0.29					
					WB#2	0.36	0.38	0.37					
					WBIL	0.33	0.36	0.34					
					BI 82194E, C4 BI 82194F, C5	175 from S of Schaefer Rd N to Leonard Ave	Kutchins Co., Inc.	E. C. Levy (Trenton & Dix)	82-10, 82-5 & 47-15	NBOL	0.41	0.48	0.43
NBCL	0.44	0.46	0.45										
NBIL	0.54	0.57	0.56										
SBOL	0.37	0.42	0.39										
SBCL	0.48	0.57	0.51										
BI 82194I, C22 BI 82194H, C24	175 from W of Green Ave E to W of Livernois Ave	L. A. Davidson Co.	E. C. Levy, Dix	82-10 & 63-55	NBOL	0.44	0.46	0.45					
					NB#3	0.48	0.52	0.50					
					NB#2	0.50	0.58	0.53					
					NBIL	0.56	0.61	0.58					
					SBOL	0.44	0.47	0.45					
					SB#3	0.47	0.52	0.49					
					SB#2	0.55	0.63	0.59					
					SBIL	0.58	0.63	0.61					
										SBOL	0.44	0.46	0.45
										NB#3	0.48	0.52	0.50
NB#2	0.50	0.58	0.53										
NBIL	0.56	0.61	0.58										
SBOL	0.44	0.47	0.45										
					SB#3	0.47	0.52	0.49					
					SB#2	0.55	0.63	0.59					
					SBIL	0.58	0.63	0.61					

1966

* See also Table 2

TABLE 1 (Cont.)
CONCRETE PAVEMENTS CONSTRUCTED IN 1966, 1967 and 1968

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction				
			Coarse	Fine		Low	High	Avg		
1967	F 06041-001	US 23 Connector from Mehta Rd E to existing US 23	L. W. Edison Co. (WB) Hodgekiss & Douma, Inc. (EB)	65-7	65-7	EBOL EBIL WBOL WBIL	0.43 0.49 0.35 0.47	0.47 0.54 0.39 0.52	0.45 0.51 0.37 0.49	
	I 06111-001	I 75 from Knekerhacker Rd N to N of M 61	L. W. Edison Co.	65-7	65-7	NBOL NBIL SBOL SBIL	0.46 0.52 0.44 0.51	0.49 0.54 0.47 0.55	0.48 0.53 0.46 0.54	
	I 09035B, C8	I 75 from Union Rd N to N of Beaver Rd	The Kutchins Co. & Kutchins Co., Inc.	71-15 & 63-4	71-15	NBOL NBIL SBOL SBIL	0.47 0.49 0.45 0.56	0.50 0.55 0.50 0.60	0.49 0.52 0.48 0.58	
	I 09035D, C9	I 75 from Beaver Rd N to Anderson Rd	Sargent Contracting Co.	65-7	65-7	NBOL NBIL SBOL SBIL	0.45 0.48 0.45 0.49	0.48 0.55 0.50 0.54	0.46 0.51 0.48 0.52	
	I 09035E, C10	I 75 from Anderson Rd N to Neuman Rd	Sargent Contracting Co.	65-7 & 71-47	65-7	NBOL NBIL SBOL SBIL	0.41 0.46 0.43 0.48	0.46 0.52 0.49 0.52	0.44 0.49 0.46 0.50	
	I 09035F, C14	I 75 from Neuman Rd N to Bay-Arenac Co. Line	Sargent Contracting Co.	65-7	65-7	NBOL NBIL SBOL SBIL	0.46 0.55 0.44 0.50	0.54 0.59 0.48 0.54	0.52 0.56 0.46 0.52	
	I 13073-001	I 69 from S of Kalamazoo River N to I 94	Carl Goodwin & Sons, Inc.	12-43 & 8-80	12-43 & 8-80	NBOL NBIL SBOL SBIL	0.51 0.55 0.50 0.51	0.54 0.59 0.54 0.56	0.52 0.57 0.53 0.53	
	I 13073-007	I 69 from N of M 60 N to "J" Drive	L. A. Davidson Co.	12-31, 12-44 30-35 & 8-80	12-44	NBOL NBIL SBOL SBIL	0.49 0.54 0.48 0.50	0.54 0.59 0.54 0.51	0.51 0.56 0.51 0.50	
	U 25042-005	M 78 reloc from Miller Rd E to Bristol Rd	Chas. D. Ringers Const. Co. & Kutchins Co., Inc.	63-54	63-54	EBOL EBIL WBOL WBIL	0.50 0.54 0.51 0.54	0.53 0.57 0.53 0.58	0.51 0.55 0.52 0.56	
	F 79032-001*	M 15 from West St E to Huron & Goodrich Sts	T. A. Forsberg, Inc. & W. F. McNally Co.	75-5	79-73	NBOL NBIL SBOL SBIL	0.37 0.40 0.50 0.36	0.41 0.44 0.51 0.41	0.39 0.42 0.60 0.38	
	U 82062-011*	US 12 from Brady St E to Rouge River	Kutchins Co., Inc.	E. C. Levy, (Trenton & Dix)	47-15	EBOL EB#3 EB#2 EBIL	0.50 0.46 0.50 0.45	0.50 0.50 0.52 0.50	0.50 0.48 0.51 0.47	
	BI 82194J, C28 BI 82194K, C29	I 75 from Junction Ave Area E to E of W. Grand Blvd	Kutchins Co., Inc.	E. C. Levy, Dix	83-7 & 03-55	EBOL EB#3 EB#2 EBIL WBOL WB#3 WB#2 WBIL	0.44 0.45 0.62 0.60 0.42 0.45 0.62 0.62	0.53 0.53 0.70 0.66 0.44 0.52 0.04 0.66	0.47 0.50 0.66 0.63 0.43 0.46 0.63 0.64	
	1968	I 06111-007	I 75 from N of M 61 N to S of Maple Ridge Rd	Denton Const. Co. & Sargent Contracting Co.	65-7	65-7	NBOL NBIL SBOL SBIL	0.42 0.47 0.40 0.42	0.49 0.59 0.54 0.53	0.45 0.52 0.47 0.49
		U 33061-020	M 43 from W. of Catherine St E to Logan St	Eisenhour Const. Co., Inc.	41-46	19-33	WBOL WBCL WBIL	0.45 0.50 0.51	0.49 0.53 0.53	0.48 0.51 0.52
		I 63174-070 BI 82252-142**	I 75 from Victor Ave N to Bernhard Ave	Cooke Contracting Co.	E. C. Levy, (Trenton & Dix)	63-7	NBOL NBCL NBIL	0.52 0.55 0.56	0.54 0.60 0.61	0.53 0.57 0.58
		BI 82195B, C19 BI 82195D, C20 BI 82251B, C45	I 75 from Lodge Freeway E to St. Antoine	L. A. Davidson Co.	E. C. Levy, Dix	63-55 & 47-15	EBOL EB#3 EB#2 EBIL WBOL WB#3 WB#2 WBIL	0.55 0.51 0.45 0.43 0.59 0.45 0.42 0.60	0.62 0.54 0.50 0.47 0.60 0.51 0.45 0.63	0.59 0.52 0.50 0.45 0.59 0.48 0.43 0.61

* See also Table 2
** Test conducted on NB only, SB too dirty and not open

TABLE 2
BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1966, 1967 and 1968

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction				
			Coarse	Fine		Low	High	Avg		
1966	Mb 50051C, C26	US 25 from Welts St N to N of Patterson Ave	Ward & VanNuck, Inc.	50-35 & 63-4	50-35	NBOL NBCL NBIL	0.39 0.43 0.43	0.41 0.45 0.45	0.40 0.44 0.44	
	Mb 63051C, C25	US 10 (SD) from Lincoln Ave SE to Webster Rd	A & A Asphalt Paving Co.	47-3	47-3	SBOL SB#3 SB#2 SBIL	0.40 0.44 0.44 0.45	0.43 0.46 0.49 0.49	0.42 0.45 0.46 0.47	
	F 77023D, C11	M 21 reloc (WB) from M 146 E to US 25	Blue Water Asphalt Co., Inc.	17-40	63-4	WBOL WBCL WBIL	0.45 0.45 0.48	Not tested 0.48 0.50	0.47 0.47 0.49	
	Mb 81031A, C4	US 12 from NE of Maple Rd, thence NE 0.707 mi	Washtenaw Asphalt Co.	47-3	81-57	EBOL EBIL WBOL WBIL	0.53 0.58 0.54 0.56	0.56 0.59 0.59 0.59	0.54 0.59 0.57 0.57	
	Mb 81072C, C6	1 94 BL from W of Arlington Blvd E to W of Chalmers Rd	Ann Arbor Construction Co.	47-3	81-57	EBOL EDIL WBOL WBIL	0.5 0.53 0.50 0.55	0.52 0.54 0.51 0.56	0.52 0.53 0.51 0.55	
	Mb 82053C, C41	US 24 from W Chicago Blvd N to M 14 and from Schoolcraft Rd N to Acacia St	Ajax Asphalt Paving, Inc.	E. C. Levy, Detroit	E. C. Levy, Detroit	NDOL NB#3 NB#2 NBIL	0.32 0.36 0.41 0.54	0.43 0.44 0.48 0.56	0.37 0.40 0.45 0.55	
	U 82062-010*	US 12 from US 24 E to Haigh St	Thompson-McCully Asphalt Paving Co.	47-3	81-82	EROL EB#3 ED#2 EBIL WBOL WB#3 WB#2 WBIL	0.38 0.44 0.44 0.43 0.42 0.42 0.45 0.41	0.41 0.44 0.47 0.44 0.45 0.42 0.46 0.44	0.39 0.44 0.46 0.44 0.44 0.42 0.46 0.42	
	Mb 82101-012	M 14 from Greenfield Rd W to Auburn Rd	Detroit Asphalt Paving Co.	47-3	47-3	EBOL EBIL WBOL WBIL	0.37 0.39 0.36 0.40	0.39 0.42 0.38 0.41	0.38 0.41 0.37 0.40	
	Mb 82121-010	1 96BS from Washington Ave to W Chicago Ave	Detroit Asphalt Paving Co.	47-3	50-41	EBOL EDIL WBOL WBIL	0.37 0.34 0.36 0.37	0.37 0.38 0.36 0.41	0.37 0.35 0.36 0.40	
	1967	Mb 09031-008	M 13 from McGraw Ave N to Lafayette Ave	Midland Contracting Co.	79-21	79-73	NBOL NBIL SBOL SBIL	0.47 0.41 0.48 0.42	0.50 0.46 0.53 0.46	0.48 0.43 0.51 0.45
		F 14042-001	US 12 from M 205 NE to E of Union Rd	Reith-Riley Const. Co., Inc.	39-1	78-25	EB WB	0.53 0.54	0.57 0.57	0.55 0.56
		Mb 23031-006	US 27 from S Limits Olivet NE to US 27BR S of Charlotte	Reith-Riley Const. Co., Inc.	47-3	12-31 & 12-35	NB SB	0.53 0.52	0.57 0.54	0.55 0.53
Mb 23043-001		M 43BR from M 43 E to M 100	Reith-Riley Const. Co., Inc.	47-3	33-6	EB WB	0.45 0.44	0.47 0.47	0.46 0.45	
Mb 25081-007		M 21 from Meida St E to Court St	Spartan Asphalt Paving Co.	47-3	63-91	EBOL EDIL WBOL WBIL	0.41 0.42 0.45 0.42	0.41 0.45 0.47 0.44	0.41 0.44 0.46 0.43	
Mb 41043-005		M 21 from W of Whitehills Ave E 1.184 mi	Reith-Riley Const. Co., Inc.	41-106	41-106	EB WB	0.57 0.55	0.58 0.57	0.58 0.56	
SS 44061-006		M 90 from M 53 E to Brown City	Williams Bros Asphalt Paving Co.	63-4	44-1	EB WB	0.57 0.58	0.62 0.64	0.59 0.61	
Mb 46061-010 (Part)		US 223 from W on Onsted Rd E to W of Wolf Creek Rd	Ayling-Cunningham Asphalt Paving Co.	47-3 & Maumee Stone Co. Maumee, Ohio	81-57	EB WB	0.56 0.53	0.58 0.57	0.57 0.55	
Mb 46061-010 (Part)		US 12 from M 50 E to E of M 124	Ayling-Cunningham Asphalt Paving Co.	47-3 & Maumee Stone Co. Maumee, Ohio	81-57	EB WB	0.48 0.51	0.49 0.53	0.48 0.52	
Mb 53011-006		M 116 from US 10 N to Dryant Ave	Laman Asphalt & Paving Co.	67-2	67-2	NBOL NBIL SBOL SBIL	0.50 0.52 0.54 0.53	0.51 0.53 0.56 0.55	0.50 0.53 0.55 0.54	

* See also Table 1

TABLE 2 (Cont.)
 BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1966, 1967 and 1968

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Course	Fine		Low	High	Avg
Me 54011-004	US 131 from 1.45 mi N of Morley N 0.96 mi; from S of Fillmore Rd N 0.58 mi & from 0.20 mi N of N Limits Big Rapids N 0.80 mi	Reith-Riley Const. Co., Inc.	54-42	54-42	NB	0.53	0.60	0.57
					SB	0.49	0.60	0.55
Mb 55011-009	US 41 from 10 th St W to Menominee River	Payne & Dolan of Wisconsin, Inc.	52-39	56-4	EBOL	0.38	0.42	0.40
					EBIL	0.42	0.45	0.44
					WBOL	0.45	0.46	0.46
					WBIL	0.38	0.39	0.39
F 55012-006	US 41 from S Limits to N Limits of Stephenson	George Hocking Const. Co.	52-39	56-4	NB	0.49	0.50	0.49
					SB	0.44	0.46	0.46
F 61023A, C4	M 46 from Sheridan Dr E to Brooks Rd	Reith-Riley Const. Co., Inc.	US Steel, Gary, Indiana	70-9	EBOL	0.32	0.36	0.34
					EBIL	0.37	0.41	0.40
					WBOL	0.37	0.43	0.40
					WBIL	0.39	0.47	0.43
Ms 61076-001	M 20 from Muskegon River N to S of M 213	Reith-Riley Const. Co., Inc.	70-9	70-9	NBOL	0.53	0.54	0.54
					NBIL	0.50	0.51	0.51
					SBOL	0.50	0.51	0.51
					SBIL	0.51	0.51	0.51
Me 63041-012	US 10 from Voorhies Rd N to Watkins Lake Rd	Lind Asphalt Paving Co.	63-4	63-4	NBOL	0.41	0.44	0.43
					NBCL	0.34	0.35	0.35
					NBIL	0.44	0.46	0.45
					SBOL	0.34	0.36	0.36
					SBCL	0.33	0.36	0.34
					SBIL	0.36	0.41	0.39
SS 74022-008	M 90 from Wildcat Rd E to US 25	Blue Water Asphalt Co., Inc.	63-4	74-51	EB	0.60	0.63	0.61
					WB	0.51	0.54	0.53
Mb 77031-004	US 25BR from W Limits of Marysville NE to SE of M 29	Blue Water Asphalt Co., Inc.	17-40	74-4	NB	0.38	0.41	0.40
					SB	0.40	0.42	0.41
F 79032-001*	M 15 from W of West St E to S of Huron & Goodrich Sta	Saginaw Asphalt Paving Co.	79-21	79-73	NB	0.33	0.35	0.34
					SB	0.35	0.37	0.36
M 79042A, C5	M 46 from W Limits of Kingston E to E Limits	Reith-Riley Const. Co., Inc.	79-21	79-21	EBIL	0.42	0.44	0.43
					WBIL	0.37	0.41	0.39
Mb 81031-005	US 12 from Neblo Rd NE to Johnson St	Ann Arbor Const. Co.	47-3	81-57	EBOL	0.44	0.52	0.48
					EBIL	0.47	0.51	0.49
					WBOL	0.43	0.52	0.49
					WBIL	0.48	0.50	0.49
I 82022A, C29	I 94 from E of Ozga Rd E to Beech-Daly Rd	Thompson-McCully Asphalt Paving Co.	47-3	81-82	EBOL	0.34	0.38	0.36
					EBCL	0.42	0.47	0.44
					EBIL	0.43	0.60	0.52
					WBOL	0.31	0.36	0.34
					WBCL	0.42	0.46	0.44
					WBIL	0.52	0.55	0.53
U 82062-011*	US 12 from Brady St E to Rouge River	Detroit Asphalt Paving Co.	47-3	47-3	EBOL	0.44	0.47	0.45
					EBCL	0.45	0.46	0.46
					EBIL	0.52	0.55	0.53
					WBOL	0.45	0.47	0.46
					WBCL	0.39	0.42	0.41
					WBIL	0.46	0.48	0.47
Mb 08011-003	M 43 from Shultz Rd N to M 37	Reith-Riley Const. Co., Inc.	41-38	8-58	EB	0.50	0.51	0.50
					WB	0.45	0.49	0.47
Mb 08052-004	M 66 from S Limits of Nashville N to N of Gregg Crossing Rd	Williams Bros Asphalt Paving Co.	34-51	34-51	NB	0.56	0.66	0.59
					SB	0.57	0.68	0.62
Mb 11052-009	US 38 from NW of I 94 N to S Limits of St. Joseph; also from N Limits of Benton Harbor N to I 196	John G. Yerington Co.	41-22 & US Steel Gary, Indiana	11-75	NB	0.32	0.43	0.37
					SB	0.31	0.42	0.37
Mb 14011-008	M 40 from Berrien-Cass Co. Line NE to W of West City Limits of Dowagiac	John G. Yerington Co.	70-9	14-36	NB	0.46	0.51	0.48
					SB	0.45	0.51	0.48
Mb 22021-006	US 2-US 141 - M 95 from E Limits of Iron Mountain W & N to N Limits of Iron Mountain	Payne & Dolan of Wisconsin, Inc.	22-69	22-14	EBOL	0.44	0.48	0.47
					EBIL	0.46	0.54	0.50
					WBOL	0.31	0.35	0.32
					WBIL	0.39	0.43	0.41
Mdb 25052-005	M 64BR from Detroit St & 1st St N to Wager St	Spartan Asphalt Paving Co.	47-3	63-54	NBOL	0.40	0.41	0.41
					NBIL	0.39	0.42	0.40
					SBOL	0.40	0.41	0.41
					SBIL	0.40	0.42	0.41

1967 (CONT.)

1968

* See also Table 1

TABLE 2 (Cont.)
 BITUMINOUS CONCRETE (4.12) CONSTRUCTED IN 1966, 1967 and 1968

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
Ma 25061-006	M 121 from I 75 E to E of Van Slyke Rd	Flint Asphalt & Paving Co.	47-3 & 32-4	63-29	EBOL	0.43	0.46	0.44
					EBIL	0.44	0.48	0.46
					WBOL	0.36	0.38	0.37
					WBIL	0.46	0.48	0.47
Mb 25071-008	M 54 from S to N Limits of Grand Blanc	Spartan Asphalt Paving Co.	63-4	63-4	NBOL	0.42	0.46	0.44
					NBIL	0.50	0.52	0.51
					SBOL	0.44	0.46	0.45
					SBIL	0.53	0.56	0.54
Mb 25091-006	M 15 from S of S Limits N to N of N Limits of Davison	Lind Asphalt Paving Co.	63-4	63-4	NB	0.49	0.51	0.50
					SB	0.46	0.47	0.46
SS 32021-005	M 142 from S Limits Pigeon E to W Limits of Elkton	Williams Bros Asphalt Paving Co.	32-4	79-78	EB	0.50	0.51	0.50
					WB	0.46	0.52	0.50
U 33084-011	US 27 from S of Douglass St N to N of Northeast Rd	Spartan Asphalt Paving Co.	47-3	34-15	NBOL	0.46	0.48	0.47
					NBIL	0.50	0.51	0.50
					SBOL	0.51	0.52	0.52
					SBIL	0.49	0.51	0.50
Ma 33082-019	M 43 from E of Hagadorn Rd E to GTWRR	Spartan Asphalt Paving Co.	47-3	34-15 & 33-79	EBOL	0.42	0.47	0.45
					EBIL	0.41	0.44	0.43
					WBOL	0.45	0.50	0.47
					WBIL	0.44	0.49	0.46
Mb 47061-012	I 96BL from M 59 E to I 96	Reith-Riley Const. Co., Inc.	47-3	47-3	EBOL	0.45	0.49	0.47
					EBIL	0.50	0.55	0.52
					WBOL	0.48	0.53	0.51
					WBIL	0.52	0.57	0.54
M 50011-024	M 53 from 18 Mile Rd N to 18-1/2 Mile Rd	Cooke Contracting Co.	50-35	50-35	NBOL	0.55	0.57	0.56
					NBIL	0.51	0.54	0.53
					SBOL	0.57	0.58	0.58
					SBIL	0.48	0.49	0.48
Mb 53032-003	US 10 - US 31 from E of W Jct. US 10 - US 31 E to Reinburg Ave	Laman Asphalt & Paving Co.	67-2	67-2	ED	0.44	0.45	0.44
					WB	0.45	0.45	0.45
Mb 54011-005	US 131 from M 46 N intermittently to M 20	Reith-Riley Const. Co., Inc.	54-42 & 42-38	54-21	NB	0.36	0.40	0.38
					SB	0.38	0.44	0.40
Mb 62011-003	M 20 - M 82 from E of W intersection of M 20 - M 82 E to C & O RR	Reith-Riley Const. Co., Inc.	41-38	62-25	EB	0.36	0.37	0.36
					WB	0.36	0.38	0.37
Mb 62022-001	M 82 from M 37 E to M 20	Reith-Riley Const. Co., Inc.	41-38	62-25	ED	0.32	0.44	0.38
					WB	0.34	0.48	0.40
Mb 63031-022	US 24 from Shallowbrook St N to S of US 10	Bit Con Corp	47-3	63-7	NBOL	0.41	0.45	0.43
					NBIL	0.42	0.43	0.42
					SBOL	0.41	0.43	0.42
					SBIL	0.44	0.49	0.47
Mb 63042-006	M 59 (Auburn Rd) from Parkhurst St E to Opydyke Rd	Bit Con Corp	63-4	63-4	EBOL	0.44	0.46	0.45
					EBIL	0.48	0.51	0.50
					WBOL	0.46	0.49	0.47
					WBIL	0.47	0.49	0.48
Mb 74073-002	US 25 from Port Sanlao N to Deckerville Rd	Ann Arbor Const. Co.	63-4	74-51	NB	0.49	0.53	0.51
					SB	0.46	0.59	0.53
Mb 80032-004	M 43 from Phoenix St N to North Shore Dr	John G. Yerington Co.	Materials Services Corp, Chicago	11-75	EB	0.44	0.48	0.46
					WB	0.44	0.44	0.44
Mb 80111-009	M 119 from NYCRR N 2.435 miles	John G. Yerington Co.	39-1	80-20	NB	0.46	0.49	0.47
					SB	0.48	0.54	0.51
Mb 81072-005	US 23BR - I 94DL from Main St E to Fletcher St & from University Ave E to Toumy Rd	Ann Arbor Const. Co.	47-3	61-57	EBOL	0.45	0.51	0.48
					EBIL	0.46	0.50	0.48
					WBOL	0.48	0.55	0.52
					WBIL	0.41	0.49	0.45
Ma 82041-017	M 17 at Beech-Daly Rd	Thompson-McCully Co., et al	75-5	47-3	EBOL	0.38	0.44	0.41
					EBIL	0.37	0.39	0.38
					WBOL	0.38	0.42	0.39
					WBIL	0.33	0.38	0.35
U 82144-016	M 102 - M 29 from Kelly Rd E to I 94	Cooke Contracting Co.	50-35	63-4 & 50-35	EBOL	0.52	0.55	0.54
					EB#3	0.53	0.55	0.54
					EB#2	0.58	0.62	0.60
					EBIL	0.58	0.63	0.61
					WBOL	0.50	0.52	0.51
					WB#3	0.47	0.51	0.49
					WB#2	0.52	0.55	0.54
					WBIL	0.58	0.62	0.60

1968 (CONT.)

TABLE 3
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1966, 1967 and 1968

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Coarse	Fine		Low	High	Avg
SS 30031A, C4	M 99 from Frontier Rd N to M 34	Ayling-Cunningham Asphalt Paving Co.	30-54	30-54	NB SB	0.64 0.65	0.65 0.67	0.65 0.66
Mb 15031-003	M 66 from M 66 relocation NW to US 31	Hodgkiss & Douma, Inc.	15-32	15-32	NB SB	0.51 0.49	0.54 0.51	0.52 0.50
Mb 20012-003	I 75BL - M 72 from RR crossing near S. Limits Grayling NW to M 93	Lake & Howell Const. Co.	69-14	69-14	NBOL NBIL SBOL SBIL	0.43 0.43 0.45 0.44	0.45 0.47 0.47 0.47	0.44 0.43 0.46 0.46
Mb 24051-001	M 131 from US 31 N to Beach Rd	Hodgkiss & Douma, Inc.	15-32	15-32	NB SB	0.41 0.39	0.45 0.43	0.43 0.41
M 31031-004	M 203 from N of Anthony Ave SE to US 41	George Hooking Const. Co.	31-45	31-45	EB WB	0.47 0.47	0.50 0.50	0.48 0.48
U 31052-001	US 41 EB from Lincoln Ave E to Reservation St.	George Hooking Const. Co.	31-45	31-45	EBOL EBIL	0.34 0.33	0.37 0.36	0.36 0.34
Mb 41091-001	M 91 from I 96 N to Lowell	Michigan Colprovia Co.	70-24	70-24	NB SB	0.55 0.54	0.57 0.54	0.56 0.54
Mb 45091-004	M 201 from M 22 N & E to Co. Rd #640	Peninsula Asphalt & Const Co.	45-19	45-19	NB SB	0.42 0.46	0.42 0.48	0.42 0.47
Mb 47041-002	M 36 from Pettysville Rd E on relocation to E of Henry Rd	Lake & Howell Const. Co.	47-26	47-26	EB WB	0.37 0.35	0.39 0.37	0.38 0.36
SS 52031-002	M 35 from Delta-Marquette Co. Line NW to S of Little Lake	Payne & Dolan of Wisconsin, Inc.	52-36	52-36	NB SB	0.63 0.65	0.67 0.71	0.65 0.68
Mb 59022-004	M 91 from N of Colby Rd N to M 46	Reith-Riley Const. Co., Inc.	59-55	59-55	NB SB	0.46 0.48	0.56 0.53	0.51 0.51
Mb 65021-001	M 55 from West Branch E to M 33	Saginaw Asphalt Paving Co.	65-47	65-47	EB WB	0.52 0.49	0.54 0.53	0.53 0.51
Mb 66012-004	M 64 from Mineral River N & E to Stony Creek	Fox Valley Const. Co.	66-63	66-63	NB SB	0.48 0.51	0.59 0.62	0.53 0.56
SS 66013C, C3 SS 66013A, C4	M 64 from Stony Creek E to US 45	George Hooking Const. Co.	66-63	66-63	EB WB	0.44 0.44	0.52 0.52	0.47 0.48
Mb 67014-005 (Part)	US 131 from Reed City N 8.527 miles	The Hicks Company	67-2 & 54-45	67-2 & 54-45	NB SB	0.47 0.49	0.57 0.58	0.50 0.53
Mb 67014-005 (Part)	M 66 from Mecosta-Osceola Co. Line N 6.013 miles	The Hicks Company	67-2 & 54-45	67-2 & 54-45	NB SB	0.52 0.48	0.54 0.52	0.52 0.50
Mb 68012-004	M 33 from M 72 N to S of County Rd #612	Reith-Riley Const. Co., Inc.	68-14	68-14	NB SB	0.50 0.56	0.55 0.60	0.52 0.58

1967

1967

TABLE 3 (Cont.)
BITUMINOUS AGGREGATE (4.11) CONSTRUCTED IN 1966, 1967 and 1968

Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction		
			Course	Fine		Low	High	Avg
SS 01024-002	M 72 from Co. Rd #171 E to US 23	Central Paving Co.	1-6	1-6	EB WB	0.35 0.36	0.37 0.40	0.36 0.38
Mb 02021-009 (Part)	M 94 from E of Marquette-Alger Co. Line E to M 28	Fox Valley Construction Co.	2-1	2-1	EB WB	0.47 0.54	0.49 0.58	0.48 0.56
Mb 02021-009 (Part)	M 67 from US 41 N 2.833 miles	Fox Valley Construction Co.	2-1	2-1	NB SB	0.48 0.54	0.51 0.57	0.50 0.56
Mb 18022-006 (Part)	US 10 from W City Limits of Farwell W to M 115	The Hicks Company	26-28	--	EB WB	0.25 0.26	0.27 0.27	0.26 0.26
Mb 18022-006 (Part)	M 61 2 miles W of Clare-Gladwin Co. Line	The Hicks Company	26-28	--	EB WB	0.41 0.48	0.51 0.50	0.45 0.49
Mb 18022-006 (Part)	Intermittent Patching: M 61 from 3 miles E of M 30 E 7 miles	Central Paving Co.	65-47	--	EB WB	0.41 0.48	0.43 0.50	0.42 0.49
Mb 20032-004 (Part)	I 75BL - M 98 from N of M 72 N 2.54 mi	Lake Construction Company & Howell Construction Company	20-36	--	NB SB	0.33 0.29	0.36 0.32	0.35 0.30
Mb 20032-004 (Part)	M 93 from Co. Rd #612 S 2.95 mi	Lake Construction Company & Howell Construction Company	20-36	--	NB SB	0.47 0.40	0.49 0.46	0.48 0.43
F 22012-002**	M 95 from US 2 N to Co. Rd #569	Payne & Dolan of Wisconsin, Inc.	22-69	--	NB SB	0.27 0.22	0.31 0.23	0.28 0.23
Mb 24051-002	M 131 from N of US 31 N & W to Zoll St	Hodgkiss & Douma, Inc.	15-32	--	NB SB	0.24 0.21	0.43 0.36	0.32 0.27
M 27022-003	US 2 from E of Jackson Creek E intermittently to E of Slate River	Payne & Dolan of Wisconsin, Inc.	27-67	27-67	EB WB	0.51 0.46	0.56 0.53	0.54 0.50
SS 31013-008	M 26 from Lake Louden N to Laurium	George Hocking Const. Co.	31-45	31-45	NBOL NBIL SB	0.44 0.45 0.42	0.46 0.49 0.43	0.45 0.47 0.43
Mb 48041-002	M 28 from Schoecraft-Luce Co. Line E to M 123	Lake Construction Co. & Howell Construction Co.	48-10	48-10	EB WB	0.32 0.33	0.37 0.36	0.35 0.34
Mb 57041-001	M 42 from M 37 E to M 66	Globe Construction Co.	83-6	83-6	EB WB	0.42 0.47	0.50 0.54	0.46 0.50
Mb 83021-008**	M 55 from Co. Rd #21 E to M 115	The Hicks Company	83-12	83-12	EB ⁽¹⁾ WB ⁽¹⁾ EB ⁽²⁾ WB ⁽²⁾	0.29 0.29 0.37 0.41	0.31 0.32 0.39 0.48	0.30 0.30 0.38 0.44

* Also reported in Table 23
** Also reported in Table 24
(1) East end of job
(2) West end of job

TABLE 4
MISCELLANEOUS BITUMINOUS SURFACES CONSTRUCTED IN 1967 and 1968

	Project No.	Location	Paving Contractor	Aggregate Sources		Direction and Lane	Coefficient of Wet Sliding Friction			
				Coarse	Fine		Low	High	Avg	
1967	<u>STONE-FILLED SAND ASPHALT</u>									
	Ms 21024-008 (Part)	US 2 from the Soo Line RR E 4.429 miles	Payne & Dolan of Wisconsin, Inc.	75-5	21-12	EB WB	0.58	0.63	0.60	
							0.58	0.64	0.61	
	Ms 25081-006	M 21 from E of Dye Rd E to Meida St	Ann Arbor Const. Co.	63-4	63-54	EBOL FBIL WBOL WBIL	0.43	0.44	0.43	
							0.56	0.60	0.58	
							0.42	0.44	0.43	
							0.46	0.49	0.48	
	Ms 46072-007	M 52 from Adrian NE to N of Raisin River Bridge	Ayling-Cunningham Asphalt Paving Co.	47-3	81-57	NB SB	0.44	0.49	0.47	
							0.46	0.48	0.47	
	Ms 77033-008	US 25 from Lynburner Rd N to N of Myrtle Rd	Frank Strausberg & Son Co.	17-40	74-51	NB SB	0.48	0.50	0.49	
0.44							0.47	0.45		
Mb 79051-007	M 24 from M 46 N to Frank St	Saginaw Asphalt Paving Co.	17-40	79-73	NB SB	0.50	0.57	0.53		
						0.46	0.57	0.51		
1968	Ms 09011-003	M 84 - I 75BL from SW of Ziegler Rd NE to M 13	Saginaw Asphalt Paving Co.	17-40	79-73	NB SB	0.43	0.45	0.44	
							0.41	0.44	0.42	
	Mb 49023-009 (Part)	US 2 from W of Co. Rd - 402 E to W of I 75	Lake Construction Company & Howell Construction Company	75-5	70-9	EB WB	0.30	0.34	0.32	
							0.30	0.36	0.33	
	Mb 49023-009 (Part)	I 75BL from Burdette St N to Marquette St	Lake Construction Company & Howell Construction Company	75-5	70-9	NBOL NBIL SBOL SBIL	0.39	0.41	0.40	
							0.41	0.42	0.41	
							0.40	0.42	0.41	
							0.45	0.48	0.46	
	1967	<u>SPECIAL HOT EMULSION WEARING COURSE MIXTURE</u>								
		Mb 38061-008 (Part)	M 60 from Calhoun-Jackson Co. Line E to Spring St	Reith-Riley Const. Co., Inc.	----	12-35	EB WB	0.56	0.59	0.57
0.50								0.57	0.52	
Mb 58042-008		M 50 from US 24 to US 25	Ayling-Cunningham Asphalt Paving Co.	----	E. C. Levy, Trenton	EB WB	0.48	0.49	0.48	
							0.48	0.48	0.48	
1968		Mb 38061-008 (Part)	M 50 from Stoney Lake Rd. W to S Limits Jackson, omitting at US 127 interchange	Workman-Richardson Asphalt Co.	----	46-28	EB WB	0.50	0.56	0.53
								0.46	0.53	0.50
		Mb 82052-037	US 24 from Carter Rd N to Pardee Rd	Detroit Asphalt Paving Co.	----	47-15	NBOL NBIL SBOL SBIL	0.43	0.46	0.44
								0.44	0.51	0.47
								0.47	0.52	0.49
	0.43							0.52	0.48	
	1967	<u>NSST (SINGLE SEAL)</u>								
		Mm 7SC-8C (Part 38073)	M 50 from M 99 E to US 127	Spartan Asphalt Paving Co.	----	38-46	EB WB	0.49	0.51	0.50
								0.52	0.55	0.54
		Mm 7SC-8C (Part 81011)	M 52 from I 94 N to Territorial Rd, omitting village of Chelsea	Spartan Asphalt Paving Co.	----	38-46	NB SB	0.50	0.52	0.51
0.54								0.55	0.54	
Mm 8SC-2A (49031)		M 117 from US 2 N to Mackinac-Luce Co. Line	Yockey Construction, Inc.	----	49-57	NB SB	0.58	0.60	0.59	
							0.60	0.63	0.61	
1967		<u>NSST (DOUBLE SEAL)</u>								
		Ms 21024-008 (Part)	US 2 from County Rd J-1 in Ensign W 1.695 miles	Payne & Dolan of Wisconsin, Inc.	75-5	21-12	EB WB	0.16	0.25	0.21
0.17								0.28	0.23	
1968	<u>BITUMINOUS NS RESURFACING</u>									
	Ms 82053-044*	US 24 from Joy Rd N to W Chicago Blvd	Stolaruk Asphalt Paving, Inc.	----	47-3	NBOL ND43 NB#2 NBIL	0.58	0.61	0.59	
							0.59	0.62	0.60	
							0.60	0.62	0.61	
							0.60	0.62	0.61	
0.60							0.62	0.61		

* Also reported in Table 17 and as 68 SR-3 in Table 24.

SECTION II
FRICTION LEVELS DETERMINED
AFTER A FIVE-YEAR SERVICE PERIOD

Tables 5 and 6 contain skid test results from 78 portland cement concrete pavements consisting of 274 lanes which were constructed during 1963. Eleven of these projects, tested in 1964 after one year's service, had an average wsf coefficient of 0.61 with friction levels on the outer (traffic) lanes averaging 0.05 lower than on inner (passing) lanes. The remaining 67 projects were not initially tested until 1965, their second year of service. Friction levels determined on these averaged 0.49 with the outer (traffic) lanes' friction level averaging 0.05 lower than the inner (passing) lanes' level. These same 78 projects were retested in 1968 after five years of service and friction levels on 56 lanes tested (15 percent of the total lane miles) were below the Departmental Safety Standard.

Tables 7 and 8 contain wsf values representing the performance of 58 bituminous concrete projects which were constructed during 1963. In 1964, initial skid tests conducted on 22 of these projects indicated average friction levels of 0.49 and values determined in the inner (passing) lanes averaged 0.05 higher than in the outer (traffic) lanes. The remaining 36 projects were not initially tested until 1965 after two years service when the average wsf value was 0.44. Inner (passing) and outer (traffic) lanes yielded two-year wsf values of 0.43 and 0.44, respectively. Skid tests conducted at the five-year service level yielded an average wsf value of 0.48 for these projects. Also after five years of service, 34 of the 137 lanes, representing 20 percent of the total lane miles, yielded an average wsf value below 0.40. Average coefficient for these 34 lanes was 0.36, only 0.04 below the Departmental Safety Standard.

Tables 6a and 8a summarize skid data for portland cement concrete and bituminous concrete projects, respectively. These tables show that, in general, no significant change in friction level occurred between initial tests in 1964 and 1965 and five-year service tests in 1968.

Tables 9 and 10 report skid test results for six bituminous aggregate projects constructed during 1963. The four lanes, initially tested during 1964, yielded an average friction level of 0.68 and the six lanes initially tested during 1965 yielded an average friction level of 0.57. After a five-year service period, friction level on all lanes tested averaged 0.61. Skid resistance level has increased slightly on six of the ten lanes after five years.

Table 11 contains a prime and double seal project which has skid tests conducted after a one-year service period, in 1964, and again after a five-year service period, during 1968. Average coefficients at the five-year level are excellent with values of 0.60 and 0.56, respectively for the north and southbound lanes.

TABLE 5
CONCRETE PAVEMENTS TESTED DURING 1964 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Coarse	Fine		1964	1968
BI 17033A, C5 RN	I 75 from Mackinac Co. Line N to N of M 48	Hodgkiss & Douma, Inc.	17-63	17-63	NBOL	0.61	0.65
					NBIL	0.65	0.71
					SBOL	0.60	0.60
					SBIL	0.60	0.69
BI 17033A, C9 RN	I 75 from N of M 48 N 1.886 mi	Hodgkiss & Douma, Inc.	17-63	17-63	NBOL	0.60	0.64
					NBIL	0.62	0.70
					SBOL	0.63	0.64
					SBIL	0.63	0.69
BI 17033E, C12	I 75 from Old US 2 N to N of M 28	Pierson Contracting Co.	17-20	17-20	NBOL	0.60	0.59
					NBIL	0.61	0.70
					SBOL	0.59	0.51
					SBIL	0.64	0.70
BI 17034A, C14	I 75 from N of M 28 N to S of Six Mile Rd	Hodgkiss & Douma, Inc.	17-20	17-20	NBOL	0.65	0.56
					NBIL	0.68	0.76
					SBOL	0.67	0.55
					SBIL	0.68	0.73
BI 17034B, C15	I 75 from S of Six Mile Rd N to S of Sault Ste. Marie	Hodgkiss & Douma, Inc.	17-20	17-20	NBOL	0.66	0.52
					NBIL	0.70	0.74
					SBOL	0.64	0.44
					SBIL	0.64	0.68
U 21031E, C3*	M 35 from S limits of Escanaba NE & N to US 2 - US 41	Fox Valley Construction Co.	75-5	21-12	NBOL	0.51	0.44
					SBOL	0.56	0.54
BI 49025E, C18 RN	I 75 from S of M 123 N to N of M 134	Pierson Contracting Co.	17-63 & 49-88	17-63	NBOL	0.57	0.59
					NBIL	0.58	0.63
					SBOL	0.60	0.54
					SBIL	0.62	0.66
BI 49025H, C20 RN	I 75 from S of FAS 1052 N to Chippewa Co. Line	Hodgkiss & Douma, Inc.	17-63	17-63	NBOL	0.60	0.62
					NBIL	0.67	0.71
					SBOL	0.61	0.60
					SBIL	0.64	0.68
BI 49025G, C22 RN	I 75 from N of M 134 N to S of FAS 1052	Pierson Contracting Co.	17-63	17-63	NBOL	0.64	0.64
					NBIL	0.64	0.71
					SBOL	0.60	0.59
					SBIL	0.65	0.67
U 52042E, C9	M 28 - US 41, Marquette By-Pass	Bacco Construction Co.	52-56	52-57	EBOL	0.55	0.49
					EBIL	0.58	0.66
					WBOL	0.57	0.50
					WBIL	0.64	0.63
U 55031A, C9*	M 35 from US 41 NE to N limits of Menominee	Casplan Construction Co.	55-4 & 55-115	55-4	NBOL	0.50	0.49
					SBOL	0.47	0.50

* For additional data see Table 7.

TABLE 6
CONCRETE PAVEMENTS TESTED DURING 1965 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction				
			Coarse	Fine		1965	1968			
BI 03033B, C14	1196 from 101st Ave N to 109th Ave	Carl Goodwin & Sons, Inc.	3-65	3-65	NBOL	0.52	0.45			
						NBIL	0.63	0.59		
						SBOL	0.55	0.45		
						SBIL	0.62	0.62		
BI 03033D, C16	1196 from 109th Ave to N of 116th Ave	L. W. Edison	3-65	3-65	NBOL	0.55	0.53			
						NBIL	0.63	0.66		
						SBOL	0.55	0.51		
						SBIL	0.58	0.64		
BI 03034D, C11	1198 from N of Washington Rd N to S of 61st St	Titus Construction Co.	70-9 & 75-5	3-47 & 70-9	NBOL	0.57	0.45			
						NBIL	0.61	0.62		
			75-5	3-65	SBOL	0.55	0.48			
						SBIL	0.60	0.62		
BI 03033E, C12 BI 03034A, C7	1196 from N of 116th Ave N to S of Adams Rd	Carl Goodwin & Sons, Inc.	3-65 & 75-5	3-47 & 3-65	NBOL	0.55	0.50			
						NBIL	0.62	0.60		
			75-5	3-65	SBOL	0.55	0.52			
						SBIL	0.62	0.65		
BF 03032A, C3 BF 03032A, C4	US 31 from S of 61st St NE to N of 58th St	Titus Construction Co.	70-9 & 75-5	3-47 & 70-9	NBOL	0.53	0.50			
						NBIL	0.58	0.67		
			75-5	70-9	SBOL	0.51	0.46			
						SBIL	0.57	0.66		
F 13022C, C7	M 60 from W of Goldup St, in Homer, to E of the Kalamazoo River	Titus Construction Co.	30-35	30-35	EBOL	0.48	0.46			
						WBOL	0.44	0.41		
US8 33011B, C3* US8 33011D, C4	M 80 from I 96 N to N of the NYCRR	Eisenhour Const. Co., Inc.	34-48	33-79	NBOL	0.42	0.35			
						SBOL	0.40	0.38		
I 33045D, C1 I 33045B, C2 I 33045F, C3	1496 from S of Cavanaugh Rd N to Mt. Hope Ave	Sargent Construction Co.	47-3	33-6	NBOL	0.49	0.39			
						NBIL	0.67	0.50		
						SBOL	0.42	0.34		
						SBIL	0.52	0.46		
BF 39014A, C12 BF 39014A, C14 BI 39024B, C15	US 131 from I 94 NW to "M" Ave	W. H. Knapp, Inc.	3-44	3-44	NBOL	0.52	0.47			
						NBIL	0.55	0.59		
						SBOL	0.53	0.46		
						SBIL	0.55	0.56		
BF 39014A, C23	US 131 from "M" Ave N 2.14 mi	W. H. Knapp, Inc.	3-44	3-44	NBOL	0.59	0.48			
						NBIL	0.65	0.62		
						SBOL	0.55	0.38		
						SBIL	0.62	0.61		
U 39041A, C5*	US 31BR (Stadium Dr) from E of US 31 NE to SW of Michigan Ave in Kalamazoo	W. H. Knapp, Inc.	3-44	3-44	EBOL	0.50	0.39			
						WBOL	0.50	0.42		
I 41027F, C59	1196 from Fuller Ave E to I 96	L. W. Edison	41-46	41-46	EBOL	0.58	0.48			
						EBIL	0.58	0.54		
						WBOL	0.58	0.49		
						WBIL	0.61	0.49		
U 46061D, C6 SS 46071A, C1	M 52 from Michigan-Onto Slate Line N to S limits of Adrian	Hertel-Deyo Co.	France Stone, Ohio	46-16	NBOL	0.52	0.39			
						NBIL	0.47	0.40		
			46-16	46-16	SBOL	0.54	0.46			
						SBIL	0.44	0.37		
BI 50111I, C12	I 94 from the Clinton River Spillway Bridge N to S of Joy Rd	L. A. Davidson	E. C. Levy (Dix Yd.)	50-21	NBOL	0.50	0.46			
						NBCL	0.47	0.51		
			50-21	50-21	NBIL	0.54	0.62			
						SBOL	0.63	0.43		
			50-21	50-21	SBCL	0.56	0.55			
						SBIL	0.58	0.60		
BI 50111J, C13	I 94 from S of Joy Rd to N of Cotton Rd	Denton Constr. Co.	60-35 & 63-4	60-35	NBOL	0.48	0.41			
						NBCL	0.56	0.48		
			60-35 & 63-4	60-35	NBIL	0.56	0.60			
						SBOL	0.48	0.46		
			60-35 & 63-4	60-35	SBCL	0.33	0.43			
						SBIL	0.59	0.62		
BI 50111K, C22 RN BI 50112A, C1 RN	I 94 from N of Cotton Rd NE to N of the Macomb-St Clair County Line	Sargent Constr. Co.	75-5	50-22	NBOL	0.49	0.44			
						NBCL	0.54	0.51		
						50-22	50-22	NBIL	0.59	0.59
									SBOL	0.47
						50-22	50-22	SBCL	0.51	0.44
									SBIL	0.58
U 56023A, C10 F 56023A, C11	M 20 (Buttles St) from US 10BR (Eastman) SE to 2nd St & on Indian St from US 10BR (Eastman) SE to 1st St, in Midland	Titus Construction Co.	75-5	37-26	SBOL	0.37	0.40			
						SBCL	0.38	0.36		
						SBIL	0.40	0.42		
EBBU 63081D, C8	I 686 BS from E of US 24 SE to W of Lahser Rd	The Kutchins Co.	E. C. Levy (Dix Yd.)	53-7	EBOL	0.35	0.35			
						EBCL	0.40	0.42		
						EBIL	0.40	0.47		
						WBOL	0.37	0.48		
						WBCL	0.42	0.38		
						WBIL	0.43	0.36		

* For additional information see Table 8.

TABLE 6 (Cont.)
CONCRETE PAVEMENTS TESTED DURING 1965 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Course	Plane		1965	1968
EBBU 63081E, C4	1 696 BS from NE of Lee Baker Dr NE to NW of Lahser Rd	L. A. Davidson	47-3 & E. C. Levy (Dix Yd. & Trenton Yd.)	47-3, 63-7 & 63-48	EBOL	0.39	0.39
					EBCL	0.47	0.43
					EBIL	0.52	0.48
					WBOL	0.43	0.41
					WBCL	0.47	0.44
WBIL	0.61	0.52					
EBBU 63082A, C3	1 696 BS and Northwestern Hwy from E of 12 Mile Rd SE to E of US 24	The Kutchins Co.	E. C. Levy (Dix Yd.)	63-7	NBOL	0.46	0.44
					NB#4	0.46	0.40
					NB#3	0.43	0.39
					NB#2	0.36	----
					NBIL	0.43	----
					SBOL	0.46	----
					SB#4	0.39	----
					SB#3	0.32	0.38
					SB#2	0.40	0.47
SBIL	0.49	0.54					
BI 63101D, C8	1 696 from W of Franklin Rd SE to W of US 24	The Kutchins Co.	E. C. Levy (Dix Yd.)	63-7	EBOL	0.43	0.32
					EBIL	0.46	0.41
					WBOL	0.38	0.42
					WBIL	0.45	0.39
U 63171A, C1 BU 82193B, C9	M 39 from Cornell Ave S to Trojan Ave	Cooke Contracting Co.	47-3	47-3	NBOL	0.49	0.41
					NBCL	0.50	0.44
					NBIL	0.46	0.39
					SBOL	0.46	0.39
					SDCL	0.48	0.38
					SBIL	0.49	0.37
BI 63172A, C1	175 from N of Auburn Rd to S of Walton Blvd	Pierson Contr. Co.	63-4	63-4	NBOL	0.46	0.39
					NBIL	0.52	0.49
					SBOL	0.46	0.39
					SBIL	0.57	0.47
BI 63174E, C2	175 from W of M 150 W & N to N of 17 Mile Rd	Cooke Contracting Co.	63-4	63-4	NBOL	0.44	0.38
					NBCL	0.61	0.48
					NBIL	0.57	0.58
					SBOL	0.43	0.43
					SBCL	0.54	0.42
					SBIL	0.58	0.51
BI 63174F, C3	175 from S of E Long Lake Rd N & W to E of Adams Rd	Sargent Constr. Co.	63-4 & 63-9	63-4	NBOL	0.46	0.51
					NBCL	0.54	0.48
					NBIL	0.60	0.59
					SBOL	0.47	0.43
					SBCL	0.52	0.48
					SBIL	0.57	0.57
BI 63174G, C4	175 from E of Adame Rd W & N to Auburn Rd	Sargent Constr. Co.	63-4	63-4	NBOL	0.50	0.46
					NBCL	0.50	0.50
					NBIL	0.54	0.51
					SBOL	0.46	0.44
					SBCL	0.49	0.47
					SBIL	0.58	0.55
BI 63174I, C5 BI 63174D, C14	175 from 11 Mile Rd N to N of 13 Mile Rd	Cooke Contracting Co.	63-4 & E. C. Levy (Dix Yd.)	50-15 & 63-4	NBOL	0.38	0.39
					NBCL	0.46	0.45
					NBIL	0.55	0.49
					SBOL	0.44	0.38
					SBCL	0.50	0.42
					SBIL	0.58	0.49
BI 63174I, C6 BI 63174J, C7 BI 63174E, C8	175 from N of 13 Mile Rd N & W to W of M 150	Denton Constr. Co.	63-4	50-35 & 63-4	NBOL	0.44	0.38
					NBCL	0.51	0.45
					NBIL	0.58	0.51
					SBOL	0.46	0.38
					SBCL	0.52	0.47
					SBIL	0.56	0.52
U 63201A, C3 U 63201A, C4	175BL - US 10BR (Widetrack Dr) from Whittemore St S counter clockwise to W Haron St in Pontiac	Oak Construction Co.	63-4	63-4	OL	0.39	0.36
					#3	0.38	0.39
					#2	0.38	0.39
					IL	0.40	0.44
U 73063B, C6	M 46 from intersection of Rust and Sheridan Sts N on Sheridan to Remington St (WD); Also N on Warren St to Holland St, thence E on Holland St to Genesee St (EB) in Saginaw	W. F. McNally Co.	71-47	76-1 & 79-23	EBOL	0.38	0.35
					EBCL	0.41	0.35
					EBIL	0.39	0.39
					WBOL	0.45	0.38
					WB#3	0.41	0.38
					WB#2	0.44	0.40
WBIL	0.48	0.46					
SS 77052C, C2	M 29 from Thornapple St N to N city limits of St. Clair	Anderson & Ruzzin, Inc.	75-5	50-33	NBOL	0.43	0.43
					NBIL	0.40	0.50
					SBOL	0.42	0.49
					SBIL	0.43	0.49
BI 77111A, C2	194 from Springboard Rd NE to St. Clair Hwy	Sargent Constr. Co.	75-5	59-22 & 50-28	NBOL	0.53	0.49
					NBIL	0.58	0.60
					SBOL	0.52	0.42
					SBIL	0.57	0.57

TABLE 6 (Cont.)
CONCRETE PAVEMENTS TESTED DURING 1965 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Coarse	Fine		1965	1968
BI 77111B, C3	194 from St. Clair Hwy NE to Big Hand Rd	Sargent Constr. Co.	75-5	50-26	NBOL	0.51	0.47
					NBIL	0.59	0.62
					SBOL	0.52	0.40
					SBIL	0.59	0.54
BI 77111D, C4	194 from Big Hand Rd N to existing US 25	Sargent Constr. Co.	75-5	50-26	NBOL	0.54	0.51
					NBIL	0.62	0.66
					SBOL	0.51	0.46
					SBIL	0.60	0.58
F 78022C, C2	US 12 from M 78 (W Jct.) E to E of Vinewood Ave	Cross & White	78-5 & 78-25	78-25	EBOL	0.42	0.35
					EBIL	0.43	0.37
					WBOL	0.40	0.37
					WBIL	0.39	0.38
F 79041C, C3	M 46 from Vassar Rd E to M 24	Denton Constr. Co.	32-4	78-63	EB	0.50	0.49
					WB	0.52	0.49
BI 82111A, C19 BI 82111D, C22 BI 82251A, C14 BI 82251B, C18	175 - 1375 from S of Jefferson Ave N to Division	L. A. Davidson	E. C. Levy (Dix Yd.)	47-3, 50-24, 63-7, & 63-48	NBOL	0.50	0.46
					NB#3	0.43	0.49
					NB#2	0.42	0.43
					NBIL	0.45	0.50
					SBOL	0.48	0.43
					SB#3	0.44	0.45
					SB#2	0.45	0.49
					SBIL	0.48	Not Tested
BU 82112J, C19U	1696 Spur from N of Meyers Rd NW to N of 7 Mile Rd	Denton Constr. Co.	47-3	47-3	NBOL	0.45	0.38
					NBCL	0.47	0.41
					NBIL	0.48	0.43
					SBOL	0.46	0.40
					SBCL	0.46	0.42
					SBIL	0.47	0.43
BU 82112K, C21	1696 Spur from N of 7 Mile Rd NW to S of Greenfield	Denton Constr. Co.	47-3	47-3	NBOL	0.48	0.37
					NBCL	0.46	0.40
					NBIL	0.48	0.41
					SBOL	0.45	0.39
					SBCL	0.48	0.44
					SBIL	0.51	0.41
BU 82112L, C29U	1696 Spur from NW of Wyoming Ave NW to NW of Meyers Rd	Ministrell Const. Co., Inc.	E. C. Levy (Dix Yd.)	47-3 & 82-15	NBOL	0.41	0.38
					NBCL	0.42	0.42
					NBIL	0.45	0.50
					SBOL	0.43	0.36
					SBCL	0.45	0.39
					SBIL	0.45	0.45
BI 82191D, C9RN F 82271A, C2R	175 from S of Sibley Rd N to N of Eureka Rd	L. A. Davidson	E. C. Levy (Dix Yd. & Trenton Yd.)	82-10	NBOL	0.45	0.41
					NBCL	0.41	0.42
					NBIL	0.48	0.52
					SBOL	0.41	0.39
					SBCL	0.50	0.44
					SBIL	0.50	0.53
BU 82192C, C17	M 39 from Capitol Ave to Glendale Ave	Denton Construction Co.	47-3 & E. C. Levy (Trenton Yd.)	47-3	NBOL	0.43	0.38
					NBCL	0.47	0.41
					NBIL	0.44	0.46
					SBOL	0.44	0.37
					SBCL	0.46	0.43
					SBIL	0.43	0.40
U 82192D, C22	M 39 from S of Robinda Dr to N of Village Rd and from N of Michigan Ave to S of Ford Rd	Louis Garavaglia Contractors Inc. & The Katchins Co.	47-3 & E. C. Levy (Dix Yd. & Trenton Yd.)	47-3, 63-7, 82-5, & 82-10	NBOL	0.45	0.37
					NBCL	0.48	0.41
					NBIL	0.49	0.46
					SBOL	0.48	0.35
					SBCL	0.47	0.44
					SBIL	0.47	0.48
BU 82193B, C8	M 39 from N of McNichols Rd to N of Trojan Ave	Cooke Contracting Co.	47-3	47-3	NBOL	0.40	0.37
					NBCL	0.46	0.40
					NBIL	0.48	0.43
					SBOL	0.42	0.36
					SBCL	0.43	0.38
					SBIL	0.47	0.43
F 82211B, C16 U 82211B, C17	M 85 (Fort Rd) from Allen Rd NE to Sibley Rd	Cooke Contracting Co.	E. C. Levy (Trenton Yd.)	81-69 & 82-6	NBOL	0.42	0.41
					NBIL	0.46	0.55
					SBOL	0.36	0.38
					SBIL	0.43	0.53
BI 82251E, C10UN BI 82251F, C12UN	175 from Alexandrine to Warren	Cooke Contracting Co.	E. C. Levy (Dix Yd. & Trenton Yd.)	63-9	NBOL	0.44	0.42
					NB#3	0.44	0.47
					NB#2	0.45	0.55
					NBIL	0.48	0.59
					SBOL	0.44	0.46
					SB#3	0.44	0.48
					SB#2	0.47	0.53
					SBIL	0.49	0.68

TABLE 6a
 PORTLAND CEMENT CONCRETE PAVEMENTS
 CONSTRUCTED DURING 1963

Test Year	No. of Projects	No. of Lanes	Avg. Wsf Values			Range of Wsf Values
			OL	IL	OL + IL	
1964	11	40	.59	.64	.61	.47 to .70
1965	67	228	.47	.52	.49	.32 to .65
1968 ¹	11	40	.56	.68	.62	.44 to .76
1968 ²	67	223	.42	.52	.47	.32 to .68

(1) Initial tests conducted in 1964.

(2) Initial tests conducted in 1965.

TABLE 7
BITUMINOUS CONCRETE PAVEMENTS (4.12)
TESTED DURING 1964 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Coarse	Fine		1964	1968
DI 11014A, C7	I 94 at LaPorte Rd Intersection	Spartan Asphalt Paving Co.	Material Service Corp. Thornton, Ill	Local Pits	WBOL WBIL	0.39 0.40	0.41 0.49
SS 11019A, C1	M 239 from Indiana State Line NW to I 94	Spartan Asphalt Paving Co.	Material Service Corp. Thornton, Ill	Local Pits	NB SB	0.33 0.33	0.37 ⁽²⁾ 0.27 ⁽²⁾
Mb 11041C, C2	M 60 from US 112 E to E limits of Niles	John G. Yerington	Material Service Corp. Thornton, Ill	11-64 & 11-36	EB WB	0.38 0.39	0.34 0.33
F 11052D, C5 F 11052C, C6	US 31 - US 33 from Ferry St NE to College Ave	John G. Yerington	Material Service Corp. Thornton, Ill	11-18	NBOL NBIL SBOL SBIL	0.42 0.50 0.42 0.42	0.34 0.35 0.38 0.36
SS 17042A, C4	M 48 (FAS 1054) from Old US 2 E to I 75	Thornton Constr. Co., Inc.	17-31	17-31	EB WB	0.59 0.56	0.54 0.53
U 21031E, C5 ⁽¹⁾	M 35 from S limits of Escanaba NE & N to US 2 - US 41	Payne & Dolan of Wisconsin, Inc.	75-6	21-12	NBIL SBIL	0.44 0.44	0.37 0.38
F 21031C, C4	M 35 from S limits of Escanaba SW to S of Ford River	Payne & Dolan of Wisconsin, Inc.	75-6	21-12	NB SB	0.43 0.44	0.36 0.40
F 22022A, C7	US 2 from W limits Norway E to US 6	Payne & Dolan of Wisconsin, Inc.	22-26	22-06 & 22-18	EBOL EBIL WBOL WBIL	0.48 0.54 0.53 0.60	0.65 0.71 0.56 0.68
F 22023A, C3	US 2 from US 6 E to E limits Norway	Payne & Dolan of Wisconsin, Inc.	22-26	22-06 & 22-18	EBOL EBIL WBOL WBIL	0.42 0.52 0.50 0.52	0.61 0.51 0.56 0.54
BU 27021B, C2	US 2 from Wemple St E to E limits Ironwood	Mathy Construction Co.	27-62	27-6	EBOL EBIL WBOL WBIL	0.52 0.56 0.67 0.58	0.45 0.59 0.64 0.61
BP 27021B, C3	US 2 from E limits Ironwood E to W limits Bessemer, omitting at bridge	Mathy Construction Co.	27-62	27-6	EBOL EBIL WBOL WBIL	0.50 0.51 0.56 0.66	0.54 0.64 0.50 0.60
DF 27021G, C4	US 2 from W limits Bessemer E 0.891 mi	Mathy Construction Co.	27-62	27-6	EBOL EBIL WBOL WBIL	0.50 0.61 0.56 0.60	0.53 0.52 0.42 0.53
U 31052A, C6	US 41 (Lincoln Ave) from Quincy St SE to intersection of Hancock St & Scott Ave	Thornton Constr. Co., Inc.	31-45	31-45	SBOL SBIL	0.41 0.46	0.47 0.54
Mb 31052A, C8	US 41 (Quincy St) from Lincoln Ave E to Reservation St	Thornton Constr. Co., Inc.	31-45	31-45	WBOL WBIL	0.41 0.44	0.44 0.44
SS 52081C, C1	M 28BR from M 35 E to W limits Ishpeming	George Hocking Const.	52-39	52-9	EB WB	0.51 0.47	0.51 0.52
USS 52081C, C2	M 28BR from W limits Ishpeming E to W of Washington St	George Hocking Const.	52-39	52-9	EB WB	0.45 0.47	0.50 0.50
F 55031C, C8	M 35 from N limits Menominee N 4.583 mi	Payne & Dolan of Wisconsin, Inc.	55-4	55-4	NE SB	0.45 0.54	0.51 0.53
U 55031A, C5 ⁽¹⁾	M 35 from US 41 NE to N limits of Menominee	Payne & Dolan of Wisconsin, Inc.	55-4	55-4	NBIL SBIL	0.42 0.42	0.46 0.50
BI 80012A, C1	I 196 from Berrien Co. line N to N of 30th Ave	Globe Construction Co.	17-40	80-20 & 11-37	NBOL NBIL SBOL SBIL	0.46 0.61 0.49 0.69	0.49 0.66 0.52 0.74
BI 80012B, C3	I 196 from N of Brandywine Creek N to C&O RR	Saginaw Asphalt Paving Co.	75-5	Local Pit	NBOL NBIL SBOL SBIL	0.46 0.61 0.45 0.60	0.46 0.69 0.45 0.67
SS 80072B, C7	M 40 from Michigan Ave N to N of N limit of Paw Paw	John G. Yerington	Material Service Corp. Chicago, Ill	80-20	NBOL NBIL SBOL SBIL	0.42 0.46 0.54 0.46	0.43 0.67 0.47 0.45

(1) For additional information see Table 5.

(2) SB lane contaminated during 1968 tests.

TABLE 8
BITUMINOUS CONCRETE PAVEMENTS (4.12) TESTED DURING 1965 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Coarse	Fine		1965	1968
Mb 03072C, C4	M 40 from US 31 SE in Holland	West Shore Constr. Co.	75-5	70-27	NB SB	0.38 0.34	0.39 0.38
F 07012C, C3	US 41 from old US 41 S and SE	Thornton Constr. Co., Inc.	7-22	7-22	NB SB	0.51 0.50	0.51 0.49
F 07023C, C1	M 28 from W of the Marquette-Baraga Co. line W to W of DSSA RR	Thornton Constr. Co., Inc.	7-22	7-22	EB WB	0.64 0.65	0.53 0.54
USS 08012C, C10	M 43 (Broadway) from Thorn St to State Rd in Hastings	Rieth-Riley Constr. Co., Inc.	41-22	8-58	NBOL NBIL SBOL SBIL	0.42 0.39 0.44 0.40	0.44 0.46 0.48 0.46
F 06032C, C10	M 37 from S of 4th St in Middleville SE and E to M 43	Rieth-Riley Constr. Co., Inc.	41-22	8-58	NWB SEB	0.51 0.51	0.49 0.52
Mb 09032C, C8 Mb 09033C, C5	M 13 from N of Wilder Rd N and NW to US 23	Midland Contracting Co.	17-40	63-4	NBOL NBIL SBOL SBIL	0.36 0.43 0.38 0.46	0.46 0.50 0.42 0.48
F 13022C, C7 F 13022C, C8	M 60 from 17 Mile Rd E to E of the Kalamazoo River in Homer	Rieth-Riley Constr. Co., Inc.	12-35	Material Service Corp, Thornton Illinois	EB WB	0.47 0.46	0.43 0.46
M 16032C, C4	M 27 from Seymour St NE to US 23 in Cheboygan	Central Paving Co.	71-15	71-15	NBIL SBIL	0.32 0.29	0.51 0.49
F 22023B, C4	US 2 from E limits of Norway E to the Sturgeon River	Payne & Dolan of Wisconsin, Inc.	22-26	22-18	EB WB	0.58 0.54	0.59 0.54
USS 33011B, C3* USS 33011D, C4	M 99 from I 96 N to N of NYCRR	Spartan Asphalt Paving Co.	47-3	33-6	NBIL SBIL	0.42 0.43	0.53 0.49

* For additional information see Table 6.

TABLE 8 (Cont.)
 BITUMINOUS CONCRETE PAVEMENTS (4.12) TESTED DURING 1965 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Coarse	Fine		1965	1968
SS 33091C, C5 SS 38141C, C1 SS 81011C, C4	M 52 from 1.2 mi SE of Boyce Rd N and NW to M 106	Spartan Asphalt Paving Co.	47-3	47-3	NB SB	0.58 0.55	0.61 0.58
F 37021C, C2	M 20 from Gilmore Rd E to Mt. Pleasant	The Hicks Co.	37-26	37-26	EB WB	0.49 0.39	0.50 0.55
U 39041A, C5*	US 31BR (Stadium Dr) NE from E of US 31 to SW of Michigan Ave in Kalamazoo	Globe Construction Co.	Material Service Corp, Thornton, Illinois	39-1	EBIL WBIL	0.56 0.54	0.62 0.61
Mb 41013C, C11	US 131 from Cedar St. in Cedar Springs NE to Montcalm-Kent Co. Line	Rieth-Riley Constr. Co., Inc.	41-22	54-25	NB SB	0.38 0.37	0.48 0.51
Mb 41033C, C17 Mb 41033C, C18 Fb 61024C, C1 Mb 61024C, C2	M 37 from M 46 E to Casnovia, thence E on Old M 37 to W limits of Kent City	Paul C. Miller	17-40	70-4	EB WB	0.38 0.35	0.35 0.36
F 44031C, C1	M 53 from Main St. in Almont N to M 21 in Imlay City	Frank Strausberg & Son Co.	63-4	63-4	NB SB	0.50 0.46	0.52 0.52
F 45071C, C4	M 22 from S of Cedar Creek N 4.654 miles	Peninsula Asphalt & Constr. Co.	45-13	45-13	NB SB	0.35 0.38	0.36 0.39
F 46101A, C3	US 12 from Mill Race River E and NE to E limits of Clinton	Aying-Cunningham Asphalt Paving Co.	Maumee Stone Co. Maumee, Ohio	46-16	EBOL EBIL WBOL WBIL	0.42 0.39 0.46 0.44	0.39 0.41 0.42 0.42
U 50011A, C6	M 53 from Wayne-Macomb Co. line N to N limits of Warren, omitting that portion within limits of Centerline	Cooke Contracting Co.	63-4	82-5	NBOL NBCL NBIL SBOL SBCL SBIL	0.33 0.34 0.36 0.36 0.35 0.35	0.33 0.36 0.39 0.33 0.35 0.36

* For additional information see Table 6.

TABLE 8 (Cont.)
 BITUMINOUS CONCRETE PAVEMENTS (4.12) TESTED DURING 1965 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Coarse	Fine		1965	1968
U 50011A, C7	M 53 from S limits of Centerline N to 11 Mile Rd	Cooke Contracting Co.	63-4	82-5	NBOL NBCL	0.35 0.33	0.34 0.37
					NBIL SBOL SBCL SBIL	0.33 0.34 0.36 0.35	0.36 0.36 0.36 0.40
F 50091C, C1	M 19 from Pound Rd N to S limits of Memphis	Cooke Contracting Co.	63-4	50-26	NB SB	0.47 0.46	0.48 0.51
F 56023A, C11	US 10BR - M 20 (Indian St) from Jerome St SE to First St in Midland	Midland Contracting Co.	17-40	63-54	NBOL NBCL NBIL	0.32 0.34 0.33	0.35 0.39 0.37
BF 61075B, C1	US 31 from M 20 N to N of Burpee Rd	Spartan Asphalt Paving Co.	17-40 & 75-5	70-9	NBOL NBIL SBOL SBIL	0.45 0.61 0.45 0.61	0.47 0.63 0.44 0.58
BF 61075D, C4	US 31 from N of Burpee Rd NW to existing US 31 at Colby Rd	Spartan Asphalt Paving Co.	17-40	61-9	NBOL NBIL SBOL SBIL	0.44 0.64 0.40 0.60	0.45 0.66 0.42 0.60
Mb 77033C, C5 Mb 77033C, C6	US 25 from US 25A (Pine Grove Ave) N to US 25A (Lymburner Ave)	Blue Water Asphalt Co., Inc.	75-5	74-51	NB SB	0.34 0.32	0.42 0.38
F 78022A, C1	US 12 from US 131 E to E of E limits of White Pigeon	Rieth-Riley Constr. Co., Inc.	Material Service Corp, Thornton, Illinois	Stone Lake, Indiana	EBOL EBIL WBOL WBIL	0.42 0.35 0.47 0.37	0.40 0.42 0.39 0.41
F 81031C, C3	US 12 from SW of Mills St to NE of Saline	Washtenaw Asphalt Co.	47-3	81-1	EBOL EBIL WBOL WBIL	0.46 0.43 0.48 0.41	0.49 0.48 0.52 0.47

TABLE 8a
 BITUMINOUS CONCRETE PAVEMENTS
 CONSTRUCTED DURING 1963

Test Year	No. of Projects	No. of Lanes	Avg. Wsf Values			Range of Wsf Values
			OL	IL	OL + IL	
1964	22	60	.47	.52	.49	.33 to .69
1965	36	77	.44	.43	.44	.29 to .65
1968 ¹	22	60	.47	.54	.50	.27 to .71
1968 ²	36	77	.45	.48	.46	.33 to .66

(1) Initial tests conducted in 1964.

(2) Initial tests conducted in 1965.

TABLE 9
BITUMINOUS AGGREGATE PAVEMENTS (4.11) TESTED DURING 1964 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Coarse	Fine		1964	1968
SS 10011C, C2	M 22 from Manistee Co. Line N to M 115	Klett Construction Co.	10-25	10-25	NB SB	0.62 0.59	0.65 0.66
M 17043A, C2	M 48 from M 129 E to Goetzville	Thornton Constr. Co., Inc.	17-51	17-51	EB WB	0.75 0.76	0.75 0.73

TABLE 10
BITUMINOUS AGGREGATE PAVEMENTS (4.11) TESTED DURING 1965 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Coarse	Fine		1965	1968
F 20021C, C1	M 72 from the Kalkaska-Crawford Co. Line SE to I 75BL in Grayling	The Hicks Co.	Pit 20-39	----	EB WB	0.50 0.51	0.52 0.54
FFH 64022B, C1	M 82 relocation from 1 mi S of existing M 82 E to the Newaygo-Oceana Co. Lane in Hesperia	Spartan Asphalt Paving Co.	Pit 64-35	----	EB WB	0.58 0.56	0.61 0.60
F 66031B, C3 F 66032C, C8	US 45 from 4.9 mi S of M 28 N to M 28	Mathy Construction Co.	Pit 66-33	----	NB SB	0.64 0.63	0.60 0.56

TABLE 11
PRIME AND DOUBLE SEAL PAVEMENT TESTED DURING 1964 and 1968

Project No.	Location	Paving Contractor	Aggregate Source		Direction and Lane	Coefficient of Wet Sliding Friction	
			Coarse	Fine		1964	1968
Mm 31031, C2	M 203 from N of Anthony St NW to Powder Rd	Thornton Constr. Co., Inc.	31-45	----	NB SB	0.53 0.56	0.60 0.56

SECTION III

EXPERIMENTAL FEATURES IN PAVEMENT SURFACES

Table 12 -- Rubberized Sand-Asphalt Resurfacing; US 31, City of Charlevoix

The history of eight consecutive years of skid tests on the US 31 rubberized sand-asphalt surface are contained in Table 12. Skid tests were performed June 27 during the 1968 test year at air and pavement temperatures of 53 F. The wsf values ranged from 0.55 to 0.59 and averaged 0.57. As indicated by the 1968 tests, the friction level has increased to a point approximately 10.0-percent above that level determined initially on this surface in 1960.

Table 13 -- Asphalt Emulsion Hot Mix Surface Courses; US 127, Lansing Intersections (Project Mob 33032C, C6).

Table 13 is a summary of five years of skid tests which have been conducted at the US 127 (Cedar St) intersection with Homes St and with Baker St. The 1968 tests were conducted July 3 at air and pavement temperatures of 65 F and 80 F, respectively.

At Holmes St, the friction level on the sand emulsified hot mix surface course decayed from the initial values by 12.7 percent after the first winter. The decay continued after the second winter as average wsf values dropped to a low of 0.32, 31.9-percent below the initial level. In 1967, coefficients started increasing and continued to increase with the 1968 tests. The current average friction level is 0.41, lower than--but within--12.7 percent of the 1964 values.

At Baker St, the friction level on the bituminous concrete emulsified hot mix surface course decayed after the first winter 21.1 percent. Friction level decay continued through the 1966 tests where the average wsf value reached a low point of 0.35, 32.6-percent below the 1964 (initial) value. The 1967 tests produced the same friction level obtained the year before. In 1968, coefficients increased 0.05 to a level 23-percent below the initial level.

Intersection areas at both the above locations are worn to the original surface; however, stopping areas still have the emulsified surface courses. Wsf values determined this year do not show a distinguishable differential between surface types.

Table 14 -- 3 BC Sand-Asphalt Resurfacing, US 131 SB: North and South of Alba (Project Mm 4 BC-3A, Control Section 05072).

This 3BC sand-asphalt surface, which was placed in 1964, continues to yield good skid-resistant qualities. The 1968 tests were conducted June 27 at air

and pavement temperatures of 53 F. Coefficients are shown in Table 14. Most recent wsf values do not indicate a significant difference in performance of the two mix design variations. Through the first five years service on this project, the US 131 test area was confined to the two southbound lanes. Effective November 12, 1968, US 131 has returned to a two-lane roadway with the elimination of the former northbound lanes between M 66, in Mancelona, and M 32. Consequently, future traffic flow over the test area will carry northbound and southbound traffic.

Table 15 -- Bituminous Concrete Interstate Projects

Table 15 summarizes skid tests conducted on a representative sample of Interstate bituminous concrete projects located between Clare and Indian River. Good skid resistance performance has been maintained on these projects throughout their six- to seven-year service period. All coefficients obtained, again this year, are above the Departmental Safety Standard of 0.40.

The 1968 tests were conducted during June and October at air and pavement temperatures ranging from 38 to 53 F and from 40 to 53 F, respectively. Good performance, as indicated above, has been verified by the 1968 tests. Average wsf values this year ranged from 0.41 to 0.74 and averaged 0.57. The noticeable coefficient differential continues to exist between inner (passing) and outer (traffic) lanes. The inner lanes, as tested during 1968, averaged 21.1-percent higher than the outer lanes.

Table 16 -- Bridge Deck Surface Coatings

Table 16 summarizes skid tests conducted this year on 23 structures, eight of which have coatings applied in 1968.

1. Coal-Tar Epoxy Coatings

Skid tests on coal-tar epoxy coatings were conducted during June, July, and October at air and pavement temperatures ranging from 40 to 82 F and from 40 to 106 F, respectively. Average friction level on X01 of 11016, after a five-year service period, has dropped to 0.37, 24-percent lower than the level determined during 1967. The inner lanes of both roadways on this structure have a bituminous surface different than the outer and center lanes. Skid tests on inner lanes will not be considered in this study. After a four-year service period, B01 of 45041 yields an average friction level of 0.42, only slightly above the Departmental Safety Standard of

0.40. This value represents a 9.0-percent decrease since last year. After only a three-year service period, the average wsf values for B01 of 35032 and B04 of 06073 have decreased since the 1967 tests to 0.38 and 0.36, respectively. Initial tests were conducted on B02 of 61151 during 1968. The average wsf value determined was 0.58. This value is similar to those determined during the early stages of service on X01 of 11016, B01 of 45041, B01 of 35032, and B04 of 06073.

2. 31A Bituminous Concrete and Rubberized Sand-Asphalt Coatings

Tests have been conducted on the north five spans (31A Bituminous Concrete) and compared with the south four spans (Rubberized Sand-Asphalt) of structure X01 of 11031 since 1965. Average wsf values, as determined in 1968, on the rubberized sand-asphalt surface show a friction level decrease of 0.09 or 18 percent since the 1967 tests. Wsf values determined on the bituminous concrete surface averaged 0.42 for the second consecutive year of testing. Both surface types currently indicate similar skid resistance performance after their fourth service year. Skid tests, performed on this structure during 1968, were conducted July 7 at air and pavement temperatures of 88 and 106 F, respectively.

3. Rubberized Bituminous Concrete

Five structures, coated with rubberized bituminous concrete, were placed under study in 1967. The 1968 skid tests on these were conducted in July at air and pavement temperatures ranging from 70 to 90 F and from 78 to 106 F, respectively. This year's wsf values ranged from 0.36 to 0.56 and averaged 0.47. The average wsf value on all lanes tested this year has decreased from last year's value by 10 percent.

Six 1968 deck surfacings were added to the study this year. Skid tests were conducted on these during October and November at air and pavement temperatures ranging from 40 to 45 F. Wsf values ranged from 0.42 to 0.52 and averaged 0.45 -- 0.02 lower than the average value determined on structures already having a one-year service period.

Both the new coatings and the coatings with a one-year service period exhibit average friction levels above the Departmental Safety Standard.

4. Asbestos Mixtures

Two structures coated with bituminous mixtures containing asbestos were tested for the second consecutive year in 1968. Skid tests were conducted in July at air and pavement temperatures ranging from 78 to 90 F and 78 to 105 F, respectively. B05 of 58152 had a rubberized asbestos and bituminous concrete mixture applied to its deck in 1967. Wsf values obtained this year averaged 0.50, representing a 0.04 (9 percent) increase in skid resistance level since last year. The northbound lanes of X01 of 81075 have been coated with a mix design comprised of asbestos and sand asphalt, while the southbound employed a mixture of rubberized bituminous concrete and sand asphalt. Coatings were applied to this structure in 1967. Both northbound and southbound decks yielded an average friction level of 0.54 this year, 7- to 8-percent below last year's level.

5. Euco Coatings

Four different coatings were distributed over various deck lanes of S24 of 63174, S27 of 63174, and S10 of 82252. Clear Euco, white Euco, white membrane curing compound, and a combination of linseed oil and naphtha were the coatings applied. The 1968 skid tests were conducted July 13 at an air and pavement temperature of 78 F. After one to two years of service, these coatings are yielding average wsf values ranging from 0.34 to 0.43. Only five of the 17 lanes tested during 1968 have average friction levels of 0.40 or greater.

6. Polyurethane Coating

Another addition to the study this year was the special thin polyurethane coating on S18 of 82025. Initial skid tests were conducted in November at an air and pavement temperature of 45 F. Wsf values ranged from 0.40 to 0.55 and averaged 0.46, thereby indicating good skid resistant qualities in the initial service year.

Table 17 -- Experimental Skid Resistant Resurfacing

Skid tests were continued this year at 17 experimental skid-resistant resurfacing locations. A 50-lb/sq yd trap rock plus asphalt surface, located on M 121 at Fenton Rd (Control Section 25061), was deleted from the study this year because most of the experimental surface has been worn off through

effects of traffic and the elements. As mentioned in Research Report No. R-674, skid tests were to be continued on the two lanes of the US 23 - Grove St location (Control Section 09033), which were resurfaced with bituminous concrete by mistake, and coefficients would be compared with those determined on the experimental surface. Tests on these two lanes were unintentionally omitted from the 1968 test program but 1969 tests will be conducted.

After a three-year service period, only six of the 98 lanes of experimental resurfacing yielded average wsf values below 0.40. Coefficients determined on these 98 lanes this year ranged from 0.38 to 0.63 and averaged 0.47.

Four of the experimental surface types continue to exhibit an outstanding friction level with 1968 average wsf values exceeding 0.50. Included in the outstanding performance category are:

- (a) 80-lb/sq yd sandstone plus asphalt, in control sections 09033 and 09042
- (b) 50-lb/sq yd quartzite plus asphalt, in control sections 25072 and 25073
- (c) 50-lb/sq yd 3BC sand plus hot asphalt emulsion, in control section 81031
- (d) 50-lb/sq yd 2MS sand plus hot asphalt emulsion, in control section 81031.

The eight other mixture types have average wsf values ranging from 0.41 to 0.47.

An 80-lb crushed fine aggregate mixture was added to the study this year and initial skid tests were conducted during 1968. This mixture was applied to northbound US 24 lanes between Joy Rd and West Chicago in control section 82053. Outstanding initial wsf values ranging from 0.59 to 0.61 and averaging 0.60 were determined.

Table 18 -- Sand-Asphalt Skid-Resistant Resurfacing at Intersections

This year's testing of sand-asphalt skid resistant resurfacing at intersections was accomplished during June, July, and August at air temperatures ranging from 65 to 90 F and pavement temperatures ranging from 79 to 105 F. Friction levels for the 25 lanes tested ranged from 0.39 to 0.60 averaged 0.48.

Nine lanes were deleted from this study during 1968 because the experimental surface has been worn off. The M 44 at Cascade Rd intersection will be deleted from the study in 1969 for the same reason.

Table 19 -- Sheet Asphalt Resurfacing; US 131; Rockford to Cedar Springs (Project Mb 41013C, C12)

Skid tests were performed July 26 on the special 3BC sheet asphalt surface which was applied to correct a slippery condition on US 131 in 1963. Air temperature at time of test was 83 F while pavement temperature was 91 F. The surface under study employs mix design variations of percent bitumen and dust content. After five years of service, only minor coefficient differences are exhibited throughout this experimental surface. All lanes tested this year have average wsf values above 0.40.

Table 20 -- Special Emulsion Projects

Surfacing on these four areas was completed during the fall of 1966 by Thompson-McCully Asphalt Company. Friction levels determined from 1967 tests ranged from 0.35 to 0.43 and averaged 0.38. The 1968 tests were conducted in July at air and pavement temperatures ranging from 68 to 81 F and from 70 to 91 F, respectively. After a two-year service period, tests yielded friction levels ranging from 0.27 to 0.39 and averaging 0.34. Friction levels on these projects are below the Departmental Safety Standard for the second year.

Table 21 -- Test Areas for Analysis of Effects of Using Tungsten Carbide Cutting Edges for Snow Removal

As a part of Research Project 66 G-151, "Evaluation of Grader Blades for Snow Removal," skid tests were continued during the 1968 test year. The skid tests conducted in 1967, prior to the first winter's experimentation, on the areas deemed for conventional blade usage yielded wsf values averaging 0.57. After two years of snow removal, the average friction level determined was 0.50. In areas where the tungsten carbide blades are used, average wsf values of 0.56 and 0.53 were determined in 1967 and 1968, respectively.

Table 22 -- Skid Tests on Pavement Grooving

Skid tests were conducted on the grooved pavement, located on westbound M 43, west of Lansing and immediately west of Bon Air Rd, in April and again in November of 1968. Although coefficients have increased, friction level differentials do not appear to warrant the expense of grooving.

TABLE 12
RUBBERIZED
SAND-ASPHALT RESURFACING;
US 31 CITY OF CHARLEVOIX

Test Year	Average Coefficient of Wet Sliding Friction	
	Firestone Tire	General Tire
1958*	0.19	--
1959**	0.48	--
1960	0.52	--
1961	0.40	--
1963	0.38	--
1964	--	0.46
1965	--	0.44
1966	--	0.40
1967	--	0.40
1968	--	0.57

* Initial tests on polished portland cement surface.

** Tests conducted on temporary seal coat applied in summer 1959, with surfacing in October 1960.

TABLE 13
ASPHALT EMULSION HOT MIX SURFACE COURSES: US 127,
Lansing Intersections (Project Mob 33032C, C6)

Intersection	Surface Type	Route	Direction and Lane	Average Coefficient of Wet Sliding Friction					
				1964*	1964**	1965	1966	1967	1968
Cedar Street (US 127) at Holmes Road	Sand emulsified asphalt hot mix surface course	US 127	NBOL	0.19	0.49	0.42	0.34	0.36	0.40
				0.20	0.47	0.41	0.33	0.37	0.44
				0.23	0.45	0.40	0.29	0.36	0.37
				0.22	0.47	0.40	0.32	0.36	0.44
Avg.				0.21	0.47	0.41	0.32	0.36	0.41
Cedar Street (US 127) at Baker Street	Bituminous concrete emulsified hot mix surface course	US 127	NBOL	0.24	0.48	0.38	0.34	0.35	0.37
				0.31	0.56	0.47	0.37	0.35	0.41
				0.33	0.47	0.39	0.35	0.34	0.40
				0.32	0.55	0.39	0.35	0.35	0.42
Avg.				0.30	0.52	0.41	0.35	0.35	0.40

TABLE 14
3 BC SAND-ASPHALT RESURFACING, US 131 SB: North and South of Alba
(Project Mm 4 BC-3A, Control Section 05072)

Test Area Locations	Asphalt Cement*	Aggregate	Mineral Filler	Direction and Lane	Average Coefficient of Wet Sliding Friction					
					July 1964	Oct. 1964	June 1965	Sept. 1966	Aug 1967	June 1968
Mancelona to S of Alba	85/100 penetration (6.9-percent bitumen)	1:1 mixture from Polous and Gerstenberger Pits	fly ash (Detroit Edison)	SBOL	0.51	0.54	0.56	0.50	0.54	0.56
				SBIL	0.68	0.66	0.68	0.62	0.65	0.63
N of Alba to M 32	150/175 penetration (6.4-percent bitumen)			SBOL	0.50	0.60	0.56	0.52	0.55	0.56
				SBIL	0.63	0.68	0.68	0.64	0.67	0.62

TABLE 15
BITUMINOUS CONCRETE INTERSTATE PROJECTS

Project No.	Length, mi.	Location	Date Paved (Wearing Course)	Paving Contractor	Source of Course Aggregate	Lane ⁽¹⁾	Average Coefficient of Wet Sliding Friction							
							Firestone Tire		General Tire		Firestone Tire		General Tire	
							1961	1962	Apr. 1963	Aug. 1963	1964	1965	1966	1967
18034, C3	6.758	M 61 to Arnold Rd.	May-June 1962	Riebh-Riley	Wallace Stone Co. (Pit 32-4)	IL OL	0.52 ⁽²⁾ 0.51 ⁽²⁾	-- --	-- --	0.58 0.47	0.64 0.48	0.56 0.41	0.59 0.42	0.60 0.46
72014, C4 20016, C1	6.273	0.6 mi. S of Roscommon-Crawford Co. Line to M 18 - M 76	May-June 1962	Thornton Const.	Pickett, Schreur (Merritt Pit)	IL OL	-- 0.51 0.48	-- 0.58 0.53	-- 0.53 0.59	0.88 0.59	0.63 0.53	0.56 0.49	0.64 0.54	0.64 0.59
20015, C3	4.847	Co. Rd. 612 to N. Crawford Co. Line	Sept. 1961	Thornton Const.	McCreedy Pit (Pit 60-18)	IL OL	0.60 0.56	0.60 0.52	0.61 0.56	0.59 0.51	0.73 0.63	0.66 0.59	0.66 0.54	0.65 0.60
69013, C1	7.665	Ossego Co. Line N	Oct. 1961	Saginaw Asphalt	Afton Quarry (Pit 20-35)	IL OL	-- --	-- --	0.57 0.49	0.59 0.54	0.70 0.54	0.60 0.44	0.58 0.40	0.52 0.41
69013, C3, C5	5.385	Marlette Rd. to Charles Brink Rd.	June 1962	Saginaw Asphalt	Afton Quarry (Pit 20-35)	IL OL	-- --	-- --	0.56 0.47	0.59 0.47	0.68 0.48	0.64 0.44	0.58 0.37	0.58 0.42
16091, C9	2.629	Charles Brink Rd. N to M 32 (Gaylord)	June 1962	Spartan Asphalt	Lewiston Pit	IL OL	-- --	-- --	0.59 0.54	0.63 0.57	0.71 0.62	0.66 0.57	0.70 0.56	0.66 0.58
		0.5 mi. S of M 68 N. to MC RR	Aug-Sept 1962	East Shore Asphalt	Big Cut Pit (Pit 71-15)	IL OL	-- --	0.62 0.58	-- --	0.63 0.56	0.75 0.58	0.75 0.60	0.70 0.52	0.74 0.58

(1) IL and OL denote passing and traffic lanes.
 (2) Tested on leveling course mix.
 (3) Average of 2 series of tests in 1967.

TABLE 16
BRIDGE DECK SURFACE COATINGS

Bridge No.	Location	Year Coated	Type of Coating	Direction and Lane	Average Coefficient of Wet Sliding Friction			
					1965	1966	1967	1968
X01 of 11016	I 94 over NYCRR	1963	Coal tar epoxy plus crushed quartz	EBOL	0.50	0.41	0.46	0.34
				EBCL	-	0.45	0.53	0.42
				WBOL	0.44	0.35	0.42	0.32
				WBCL	*	0.44	0.55	0.40
B01 of 45041	M 204 over Lake Leelanau Narrows	1964	Coal tar epoxy plus quartz	EB	0.59	0.45	0.45	0.42
				WB	0.60	0.45	0.48	0.43
B01 of 35032	US 23 over Au Sable River, Oscoda	1965	Coal tar epoxy membrane and rubberized sand asphalt surface	NB	0.51	0.41	0.47	0.40
				SB	0.48	0.39	0.48	0.37
B04 of 06073	US 23 over Whitney Drain	1965	Coal tar epoxy plus quartz	NB	0.59	0.36	0.38	0.38
				SB	0.63	0.39	0.38	0.35
B02 of 61151	I 96 BS, US 31 BR over Black Creek	1968	Flexible coal tar epoxy & sand	NBOL	----	----	----	0.57
				NBIL	----	----	----	0.59
X01 of 11031	M 139 over NYCRR	1964	North 5 spans of deck only 31A bituminous concrete	NBOL	0.40	0.32	0.44	0.40
				NBIL	0.42	0.34	0.40	0.47
				SBOL	0.47	0.35	0.42	0.35
				SBIL	0.43	0.35	0.42	0.46
			South 4 spans of deck only Rubberized sand asphalt	NBOL	0.41	0.36	0.51	0.36
				NBIL	0.45	0.38	0.51	0.47
				SBOL	0.42	0.35	0.52	0.38
				SBIL	0.49	0.38	0.50	0.48
B01 of 09042	I 75 BL over Saginaw River in Bay City	1967	Rubberized bituminous concrete	EBOL	----	----	*	0.45
				EBIL	----	----	*	0.50
				WBOL	----	----	0.48	0.43
				WBIL	----	----	0.51	0.49
B02 of 11052	US 31 - US 33 over St. Joseph River in Berrien Springs	1967	Rubberized bituminous concrete	NB	----	----	*	0.39
				SB	----	----	0.43	0.36
X01 of 19032	US 27 over GTWRR in St. Johns	1967	Rubberized bituminous concrete	NBOL	----	----	0.53	0.44
				NBIL	----	----	0.56	0.50
				SBOL	----	----	0.53	0.48
				SBIL	----	----	0.60	0.56

* Due to construction in the area, it was impractical to test this year.

TABLE 16 (Cont.)
BRIDGE DECK SURFACE COATINGS

Bridge No.	Location	Year Coated	Type of Coating	Direction and Lane	Average Coefficient of Wet Sliding Friction			
					1965	1966	1967	1968
B05 of 58152	I 75 under Newport Rd, Newport	1967	Rubberized asbestos and bituminous concrete	EB	----	----	0.46	0.50
				WB	----	----	0.47	0.50
X01 of 81075	US 23 BR over Huron River, North of Ann Arbor	1967	Asbestos mix plus sand asphalt	NBOL	----	----	0.57	0.52
				NBCL	----	----	0.58	0.53
				NBIL	----	----	0.60	0.56
S24 of 63174	John R. over I 75	1967	Rubberized bituminous concrete plus sand asphalt	SBOL	----	----	0.61	0.50
				SBCL	----	----	0.59	0.55
				SBIL	----	----	0.58	0.58
S24 of 63174	John R. over I 75		Linseed oil and naphtha	NBOL	----	----	0.41	0.43
				NBIL	----	----	0.39	0.36
S27 of 63174	Nine Mile Rd over I 75		Clear Euco	SBOL	----	----	0.38	0.36
				SBIL	----	----	0.37	0.35
S27 of 63174	Nine Mile Rd over I 75		White Euco	EBOL	----	----	0.36	0.36
				EBIL	----	----	0.37	0.35
				WBOL	----	----	0.36	0.36
S10 of 82252	M 102 over I 75 Spans 1-8 (EB Deck)	1966	White membrane curing compound	WBIL	----	----	0.36	0.34
				EBOL	----	----	0.41	0.37
				EBCL	----	----	0.43	0.37
S27 of 63174	Spans 9-11 (EB Deck)		White Euco	EBIL	----	----	0.39	0.40
				EBOL	----	----	0.38	0.37
				EBCL	----	----	0.40	0.38
S18 of 82025	Allard Ave over I 94	1968	Special thin polyurethane coating	EBIL	----	----	0.40	0.40
				WBOL	----	----	0.41	0.41
				WBCL	----	----	0.42	0.38
S18 of 82025	Allard Ave over I 94	1968	Special thin polyurethane coating	WBIL	----	----	0.41	0.41
				EBOL	----	----	0.46	0.46
				EBIL	----	----	0.40	0.40
S18 of 82025	Allard Ave over I 94	1968	Special thin polyurethane coating	WBOL	----	----	0.55	0.55
				WBCL	----	----	0.55	0.55
				WBIL	----	----	0.44	0.44

TABLE 16 (Cont.)
BRIDGE DECK SURFACE COATINGS

Bridge No.	Location	Year Coated	Type of Coating	Direction and Lane	Average Coefficient of Wet Sliding Friction			
					1965	1966	1967	1968
X01 of 38101	I 94 over Grand River and NYCRR, Jackson	1967	Rubberized bituminous concrete	EBOL	----	----	0.52	0.49
				EBIL	----	----	0.59	0.55
				WBOL	----	----	0.54	0.43
				WBIL	----	----	0.55	0.53
B01 of 79051	M 24 over Cass River in Caro	1967	Rubberized bituminous concrete	NB	----	----	0.53	0.48
				SB	----	----	0.50	0.48
B01 of 61076	M 20 over Muskegon River	1968	Rubberized bituminous concrete	NBOL	----	----	----	0.46
				NBIL	----	----	----	0.48
				SBOL	----	----	----	0.44
				SBIL	----	----	----	0.44
B02 of 61076	M 20 SB over Cedar Creek	1968	Rubberized bituminous concrete	SBOL	----	----	----	0.44
				SBIL	----	----	----	0.44
B03 of 61076	M 20 NB over Cedar Creek	1968	Rubberized bituminous concrete	NBOL	----	----	----	0.46
				NBIL	----	----	----	0.45
S04 of 61072	M 46 over US 131	1968	Rubberized bituminous concrete	EBOL	----	----	----	0.45
				EBCL	----	----	----	0.43
				EBIL	----	----	----	0.45
				WBOL	----	----	----	0.42
				WBCL	----	----	----	0.43
				WBIL	----	----	----	0.50
S16 of 82111	Grand River Ave (I 96 BS) over I 696 BS	1968	Rubberized bituminous concrete	EBOL	----	----	----	0.52
				EBCL	----	----	----	0.44
				EBIL	----	----	----	0.43
				WBOL	----	----	----	0.49
				WBCL	----	----	----	0.42
				WBIL	----	----	----	0.43
S17 of 82023	Grand River Ave (I 96 BS) over I 94	1968	Rubberized bituminous concrete	EBOL	----	----	----	0.44
				EBCL	----	----	----	0.44
				EBIL	----	----	----	0.45
				WBOL	----	----	----	0.50
				WBCL	----	----	----	0.44
				WBIL	----	----	----	0.44

TABLE 17
EXPERIMENTAL SKID RESISTANT RESURFACING

Control Section	Location	Construction Months	Mixture Type	Route	Direction and Lane	Average Coefficient of Wet Sliding Friction				
						1965	1966		1967	1968
							Spring	Fall		
09033	US 23 at Linwood Rd., N of Bay City	Oct. 1965	80-lb Sandstone + asphalt	US 23	NBOL	0.71	0.49	0.43	0.50	0.51 ⁽²⁾
				US 23	NBIL	0.72	0.52	0.46	0.57	0.59 ⁽²⁾
				US 23	SBOL	0.73	0.49	0.45	0.54	0.54 ⁽²⁾
				US 23	SBIL	0.74	0.58	0.49	0.62	0.63 ⁽²⁾
09033	US 23 at Grove St., N of Bay City ⁽¹⁾	Sept.-Oct. 1965	80-lb Sandstone + asphalt	US 23	NBOL	0.73	0.53	0.49	0.59	0.55 ⁽²⁾
				US 23	NBIL	0.76	0.61	0.56	0.66	0.62 ⁽²⁾
09042	M 25 at Wagner Rd., E of Bay City	Sept. 1965	80-lb Sandstone + asphalt	M 25	EB	0.77	0.53	0.47	0.51	0.54 ⁽²⁾
				M 25	WB	0.74	0.54	0.47	0.53	0.55 ⁽²⁾
25072	M 54 at Carpenter Rd., N of Flint	Oct. 1965	50-lb Quartzite + asphalt	M 54	NBOL	0.74	0.51	0.53	0.56	0.54
				M 54	NBIL	0.78	0.55	0.54	0.59	0.62
				M 54	SBOL	0.73	0.50	0.53	0.55	0.50
				M 54	SBIL	0.76	0.56	0.54	0.62	0.60
25072	M 54 at Coldwater Rd., N of Flint	Oct. 1965	50-lb Quartzite + asphalt	M 54	NBOL	0.67	0.50	0.51	0.55	0.54
				M 54	NBIL	0.77	0.54	0.52	0.61	0.62
				M 54	SBOL	0.70	0.51	0.51	0.55	0.57
				M 54	SBIL	0.76	0.53	0.53	0.60	0.60
25073	M 54 at M 57 N of Flint	Sept. 1965	50-lb Quartzite + asphalt + additive	M 54BR	NBOL	0.70	0.48	0.43	0.53	0.56
				M 54DR	NBIL	0.71	0.53	0.47	0.55	0.58
				M 54BR	SBOL	0.65	0.50	0.44	0.52	0.55
				M 54BR	SBIL	0.71	0.52	0.49	0.58	0.61
				M 57	EB	0.70	0.51	0.45	0.55	0.56
				M 57	WB	0.72	0.53	0.48	0.55	0.56
25072	M 54 at M 54BR (S Jct.), S of Flint	Oct. 1965	50-lb crushed beach pebbles + asphalt	M 54	NBOL	0.60	0.49	0.43	0.42	0.43
				M 54	NBIL	0.66	0.47	0.41	0.44	0.45
				M 54BR	SBOL	0.62	0.47	0.46	0.40	0.44
				M 54BR	SBIL	0.66	0.47	0.41	0.41	0.48
				M 54 (Dort)	WBOL	0.62	0.45	0.45	0.46	0.50
				M 54 (Dort)	WBIL	0.62	0.45	0.47	0.48	0.52
81031	US 12, W from Neblo Rd., NW of Clinton	Sept. 1965	50-lb 3BC + hot asphalt emulsion	US 12	EB	0.60	0.49	0.49	0.49	0.52
				US 12	WB	0.62	0.47	0.45	0.49	0.55
81031	US 12, E from Lima Center Rd., NW of Clinton	Sept. 1965	50-lb 2MS + hot asphalt emulsion	US 12	EB	0.58	0.48	0.44	0.55	0.55
				US 12	WB	0.60	0.49	0.47	0.54	0.54
82052	US 24 at Fenkell Bd. (Five Mile Rd.), Detroit	Sept. 1965	50-lb 3BC + asbestos fiber + asphalt	US 24	NBOL	0.56	0.36	0.34	0.37	0.38
				US 24	NB#3	0.53	0.36	0.34	0.41	0.40
				US 24	NB#2	0.57	0.36	0.34	0.40	0.41
				US 24	NBIL	0.60	Not Tested	Not Tested	Not Tested	Not Tested
				US 24	SBOL	0.52	0.38	0.37	0.41	0.39
				US 24	SBCL	0.60	0.37	0.35	0.42	0.42
				US 24	SBIL	0.59	0.35	0.34	0.44	0.40
				Five Mile Rd.	EBOL	0.51	0.37	0.31	0.36	0.38
				Five Mile Rd.	EBIL	0.55	0.39	0.33	0.41	0.40
				Five Mile Rd.	WBOL	0.55	0.37	0.33	0.39	0.40
				Five Mile Rd.	WBIL	0.60	0.39	0.33	0.43	0.44
				82053	US 24 at Schoolcraft Rd., Detroit	Sept. 1965	50-lb 3BC + asbestos fiber + asphalt	US 24	NBOL	0.54
US 24	NBCL	0.53	0.40					0.35	0.41	0.43
US 24	NBIL	0.55	0.37					0.34	0.42	0.42
US 24	SBOL	0.48	0.34					0.33	0.41	0.39
US 24	SBCL	0.51	0.37					0.33	0.40	0.41
US 24	SBIL	0.52	0.37					0.33	0.41	0.43
Schoolcraft Rd.	EBRT	0.55	0.41					0.35	0.44	0.41
Schoolcraft Rd.	EB#3	0.52	0.38					0.36	0.44	0.41
Schoolcraft Rd.	EB#2	0.54	0.38					0.34	0.45	0.43
Schoolcraft Rd.	EBIL	0.56	0.43					0.39	0.49	0.49
Schoolcraft Rd.	WBRT	0.55	Not Tested					Not Tested	Not Tested	Not Tested
Schoolcraft Rd.	WB#3	0.55	0.43					0.34	0.45	0.41
Schoolcraft Rd.	WB#2	0.51	0.39					0.34	0.43	0.42
Schoolcraft Rd.	WBIL	0.55	0.46					0.36	0.47	0.47

TABLE 17 (Cont.)
EXPERIMENTAL SKID RESISTANT RESURFACING

Control Section	Location	Construction Months	Mixture Type	Route	Direction and Lane	Average Coefficient of Wet Sliding Friction				
						1965	1966		1967	1968
							Spring	Fall		
82053	US 24 at Plymouth Rd., Detroit	Sept.-Oct. 1965	50-lb 2MS + asbestos fiber + asphalt	US 24	NBOL	0.59	0.36	0.35	0.42	0.43
					NB#3	0.59	0.37	0.36	0.41	0.43
					NB#2	0.62	0.40	0.36	0.44	0.47
					NBIL	0.62	0.40	0.38	0.45	0.45
					SBOL	0.60	0.37	0.35	0.42	0.40
					SB#3	0.62	0.39	0.35	0.43	0.43
					SB#2	0.61	0.39	0.36	0.45	0.47
					SBIL	0.64	0.42	0.37	0.50	0.52
					Plymouth Rd. EBOL	0.62	0.40	0.36	0.41	0.41
					Plymouth Rd. EBCL	0.63	0.39	0.36	0.41	0.43
					Plymouth Rd. EBIL	0.64	0.39	0.37	0.41	0.44
					Plymouth Rd. WBOL	0.63	0.40	0.38	0.46	0.47
					Plymouth Rd. WBCL	0.61	0.41	0.37	0.44	0.44
					Plymouth Rd. WBIL	0.60	0.40	0.38	0.46	0.48
82053	US 24 at W. Chicago Rd., Detroit	Oct. 1965	80-lb 2MS + 31AA + asphalt	US 24	NBOL	0.57	0.38	0.37	0.43	0.45
					NB#3	0.58	0.40	0.37	0.43	0.45
					NB#2	0.61	0.41	0.36	0.43	0.47
					NBIL	0.62	0.40	0.37	0.42	0.49
					NBLT	0.62	Not Tested	Not Tested	Not Tested	Not Tested
					SBOL	0.56	0.42	0.41	0.44	0.41
					SDCL	0.57	0.41	0.40	0.43	0.46
					SBIL	0.59	0.41	0.40	0.43	0.47
					W. Chicago Rd. EBRY	0.63	0.45	0.44	0.48	0.50
					W. Chicago Rd. EBIL	0.63	0.44	0.40	0.42	0.46
					W. Chicago Rd. WBRT	0.63	0.43	0.41	0.47	0.50
					W. Chicago Rd. WBIL	0.63	0.41	0.37	0.47	0.47
82071	US 24 at Sibley Rd., Detroit	Oct. 1965	80-lb 3NS + 31AA + asphalt	US 24	NBOL	0.50	0.41	0.34	0.44	0.45
					NBIL	0.52	0.42	0.38	0.47	0.47
					SROL	0.51	0.43	0.39	0.46	0.47
					SBIL	0.51	0.42	0.38	0.46	0.46
					Sibley Rd. EB	0.54	0.39	0.36	0.42	0.43
					Sibley Rd. WB	0.52	0.41	0.39	0.45	0.44
11031	M 139 at Napier Rd., Benton Harbor	Oct. 1965	80-lb 3NS (P-4) + Trinidad sheet asphalt	M 139	NBOL	0.51	0.46	0.37	0.48	0.45
					NBIL	0.44	0.36	0.35	0.47	0.39
					SBOL	0.47	0.37	0.36	0.45	0.40
					SBIL	0.46	0.37	0.34	0.42	0.39
					Napier Rd. EBOL	0.43	0.39	0.38	0.47	0.42
					Napier Rd. EBIL	0.47	0.43	0.38	0.49	0.51
					Napier Rd. WBOL	0.45	0.41	0.38	0.47	0.42
					Napier Rd. WBIL	0.48	0.42	0.38	0.47	0.47
					11031	M 139 NB at Empire Rd., Benton Harbor	Oct. 1965	80-lb 3NS (P-4) + Synopal + asphalt	M 139	NBOL
NBIL	0.50	0.42	0.38	0.51						0.52
11031	M 139 SB at Empire Rd., Benton Harbor	Oct. 1965	80-lb 3NS (P-4) + asphalt	M 139	SBOL	0.45	0.38	0.40	0.51	0.43
					SBIL	0.48	0.44	0.41	0.52	0.51
82053	US 24 NB (Telegraph Rd.) from Joy Rd to West Chicago ⁽²⁾	Aug. 1968	80-lb crushed fine aggregate	US 24	NBOL	----	----	----	----	0.59
					NB#3	----	----	----	----	0.60
					NB#2	----	----	----	----	0.61
					NBIL	----	----	----	----	0.61

(1) SB stopping area resurfaced with bituminous concrete by mistake in 1967 as an overlap from Project Ms 06071-002

(2) Data also reported as 68 SR-4A, see Table 24.

(3) Data also reported as 68 SR-3, see Table 24.

TABLE 18
SAND-ASPHALT SKID RESISTANT RESURFACING AT INTERSECTIONS

Control Section	Location	Route	Direction and Lane	Average Coefficient of Wet Sliding Friction			
				1965	1966	1967	1968
13061	M 89 (formerly M 96) at Hussey Ave.	M 89	EB	0.49	0.44	0.47	0.53
		M 89	WB	0.50	0.42	0.44	0.48
25072	M 54 at Mt. Morris Rd.	M 54	NBOL	0.63	0.40	0.47	0.46
		M 54	NBIL	0.70	0.42	0.53	0.52
		M 54	SBRT	0.72	0.43	0.47	0.45
		M 54	SBIL	0.71	0.47	0.56	0.60
25091	M 15 at Lapeer Rd.	M 15	NB	0.56	0.40	0.41	0.49
		M 15	SB	0.59	0.41	0.40	0.48
33042	M 43 WB (Grand River Ave.) at Foster St.	M 43	WBOL	0.50	0.37	0.42	0.39
		M 43	WB#3	0.52	0.40	0.42	0.41
		M 43	WB#2	0.49	0.40	0.42	0.42
		M 43	WBIL	0.53	0.39	0.43	0.45
39042	M 96 at River St.	M 96	EBOL	0.50	0.46	0.47	0.60
		M 96	EBIL	0.50	0.44	0.48	0.51
		M 96	WBIL	0.50	0.38	0.48	0.51
41051	M 44 at Cascade Rd.	M 44	NBOL	0.44	0.37	0.41	0.47
		M 44	NBIL	0.48	0.41	0.45	0.48
		M 44	NBLT	Not Tested	0.41	0.53	Not Tested ⁽¹⁾
		M 44	SBOL	0.45	0.42	0.43	0.51
		M 44	SBIL	0.45	0.42	0.45	0.45
		M 44	SBLT	Not Tested	0.44	0.49	Not Tested ⁽¹⁾
47082	M 59 at Old US 23	M 59	EB	0.72	0.41	0.52	0.54
		M 59	WB	0.72	0.42	0.48	0.50
81081	M 17 at Carpenter Rd.	M 17	EBOL	0.53	0.39	0.52	0.45
		M 17	EBIL	0.50	0.36	0.54	0.44
		M 17	WBOL	0.52	0.34	0.52	Not Tested ⁽¹⁾
		M 17	WBIL	Not Tested	0.38	0.56	0.45
		Carpenter Rd.	NBOL	Not Tested	Not Tested	0.58	Not Tested ⁽¹⁾
		Carpenter Rd.	NBIL	0.53	0.36	0.59	0.43

⁽¹⁾ Lanes too dirty to obtain valid test results.

TABLE 19
SHEET ASPHALT RESURFACING; US 131: Rockford to Cedar Springs
(Project Mb 41013C, C12)

Section Designation ⁽¹⁾	Location		Materials		Average Coefficient of Wet Sliding Friction									
	Stationing	Lane	Percent Bitumen	Dust	Firestone Tire		Avg. of Both Tires		Firestone Tire		General Tire			
					Sept. 20 1963	Sept. 25 1963	Oct. 24 1963	Dec. 5 1963	May 12 1964	May 12 1964	Sept. 4 1964	May 25 1965	Sept. 25 1967	July 26 1968
A	323+90 to 299+25	SB	7.5	3.5	.35	.33	.31	.38	.45	.43	.40	.39	.42	.42
	323+79 to 314+94	NB	7.5	3.5	.35	.32	.36	.38	.45	.46	.42	.39	.45	.45
	Average				.35	.33	.33	.38	.45	.44	.41	.39	.44	.43
B	314+84 to 297+20	NB	6.5	3.5	.38	.37	.38	.42	.47	.46	.46	.39	.48	.46
	299+25 to 281+80	SB	6.5	4.5	.41	.40	.36	.42	.45	.45	.45	.38	.45	.43
	297+20 to 281+94	NB	6.5	4.5	.38	.38	.36	.45	.45	.45	.46	.41	.48	.46
Average				.40	.38	.36	.44	.44	.45	.45	.46	.39	.46	.45
D	281+80 to 264+97	SB	5.5	4.5	.44	.44	.42	.49	.49	.47	.47	.38	.47	.47
	281+84 to 268+93	NB	5.5	4.5	.44	.45	.44	.46	.51	.49	.49	.43	.49	.56
	Average				.44	.44	.43	.48	.50	.46	.46	.40	.48	.51
Kent County Resurfacing (1962)	138+88 to 156+92	SB	31A, Grand Rapids		.35	.34	.35	.44	.37	.36	.36	.36	.36	.45
	138+88 to 156+92	NB	Gravel Co. No. 8 (Pit 41-16)		.38	.35	.35	.44	.40	.39	.39	.39	.39	.46
	Average				.36	.34	.35	.44	.38	.38	.38	.38	.37	.46
Balance of Project	90+00 South	SB	6.5	4.5	.46	.40	.39	.47	.50	.47	.47	.40	.45	.51
	90+00 South	NB	6.5	4.5	.47	.40	.43	.46	.49	.47	.47	.41	.48	.50
	Average				.46	.40	.41	.46	.50	.47	.47	.40	.46	.50

(1) Test areas designated in P. J. Serafin's letter to E. A. Finney, September 16, 1963. Sheet asphalt surfacing placed September 9-13, 1963.

TABLE 20
SPECIAL EMULSION PROJECTS

Route	Location	Surface Applied	Aggregate	Direction and Lane	Average Coefficient of Wet Sliding Friction	
					1967	1968
I 696 BR	John Lodge at Wyoming	Fall 1966	(3NS) Berlin Pit Pit No. 81-82	NBOL	0.38	0.27
				NBCL	0.36	0.29
				NBIL	0.38	0.33
				SBOL	0.37	0.31
				SBCL	0.39	0.32
			SBIL	0.43	0.33	
M 85	Fort St at Sibley Rd ¹	Fall 1966	(3NS) Berlin Pit Pit No. 81-82	NBOL	0.42	0.35
				NBIL	0.39	0.38
				SBOL	0.38	0.36
				SBIL	0.40	0.35
M 153	Ford Rd at Middlebelt St	Fall 1966	(3NS) Berlin Pit Pit No. 81-82	EBOL	0.36	0.37
				EBIL	0.37	0.39
				WBOL	0.35	0.34
				WBIL	0.38	0.38
US 12	Michigan Ave at Miller	Fall 1966	(3NS) Berlin Pit Pit No. 81-82	EBOL	0.35	0.36
				EBCL	0.36	0.36
				EBIL	0.36	0.37
				WBOL	0.35	0.34
			WBCL	0.37	0.35	
			WBIL	0.36	0.35	

(¹) Also tested as a high-accident intersection in Table 23.

TABLE 21
TEST AREAS FOR ANALYSIS OF EFFECTS OF USING
TUNGSTEN CARBIDE CUTTING EDGES FOR SNOW REMOVAL

Location	Control Section	Surface Type and Construction Year	Type of Snow Removal Blade	Direction and Lane	Average Coefficient of Wet Sliding Friction		
					Oct 1967 ⁽¹⁾	May 1968	Aug 1968
I 196 commencing N of I 94 at Mile Post 1, thence N 1000 ft on NB rdwy	11111	Bituminous Concrete 1963	Conventional	NBOL	0.51	0.51	0.46
				NBIL	0.75	0.71	0.70
I 94 from Roslyn Rd Bridge, E of I 196, W 1000 ft on WB rdwy	11017	Concrete 1960	Conventional	WBOL	0.47	0.36	0.37
				WBIL	0.55	0.46	0.53
US 131, S 1000 ft from 110th Ave on SB rdwy, south of M 118	03111	Concrete 1960	Conventional	SBOL	0.63	0.41	0.41
				SBIL	0.63	0.51	0.58
M 89 from 8th St, SE of Plainwell E 1000 ft on EB rdwy	03024	Bituminous Concrete 1962	Conventional	EB	0.47	0.51	0.48
I 94, W 1000 ft from Empire Ave, on WB rdwy, W of I 196	11016	Concrete 1960	Tungsten Carbide	WBOL	0.49	0.42	0.40
				WBCL	0.59	0.52	0.51
				WBIL	0.60	0.59	0.64
I 196, commencing N of I 94, at Mile Post 11, thence N 1000 ft on NB rdwy	80012	Bituminous Concrete 1963	Tungsten Carbide	NBOL	0.45	0.51	0.45
				NBIL	0.74	0.73	0.73
I 196 commencing N of South Haven at Mile Post 31, thence N 1000 ft on NB rdwy	03033	Concrete 1963	Tungsten Carbide	NBOL	0.57	0.50	0.51
				NBIL	0.65	0.66	0.66
M 89, E 1000 ft from 59th St on EB rdwy, west of Fennville	03021	Bituminous Concrete 1960	Tungsten Carbide	EB	0.37	0.41	0.36

⁽¹⁾ Control skid tests conducted before using the experimental blade.

TABLE 22
SKID TESTS ON PAVEMENT GROOVING

Test Date	Average Coefficient of Wet Sliding Friction		
	Conventional Pavement	Transverse Grooving	Longitudinal Grooving
10-22-63	0.28	----	----
5-22-66	0.31	----	----
10-23-67	0.31	----	----
11-10-67	----	0.35	0.34
4-18-68	0.39	0.39	0.41
11- 1-68	0.36	*	0.40

* Testing of transverse grooving eliminated due to short length of test area

SECTION IV
HIGH-ACCIDENT LOCATIONS

This section reports the Department's continuing program to reduce skidding accidents on wet pavement at critical locations. High-accident locations selected are skid-tested to indicate priorities for resurfacing. In some cases, these locations are used for testing of experimental skid-resistant resurfacing mixtures.

Selection of this year's high-accident locations was made by the Traffic Division and is based on 1967 accident data. Skid tests yielded average wsf values below 0.40 at 68 percent of the 1,121 lanes tested. Friction levels for 11 percent of the lanes averaged below 0.30 and six lanes had average coefficients lower than 0.20.

During 1968, tests were conducted on 51 different major highway routes. Testing was dispersed throughout 10 Districts, 32 Counties, and 216 separate locations. Table 23 summarizes the high-accident skid tests.

TABLE 23
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1987 Accidents		Surface Type	Average Coefficient
	Wet Surface	Total		
Dickinson County				
US 2 - US 141 - M 95 various locations for 5.862 miles in Dickinson Co. (Control Sections 22011 and 22021)	NA	US 2 - US 141 - M 95, EBOL US 2 - US 141 - M 95, EBIL US 2 - US 141 - M 95, WBOL US 2 - US 141 - M 95, WBIL	BC BC BC BC	0.47 0.50 0.33 0.41
M 95 from Junction of US 2 and US 141 North to Co. Rd 569, in Dickinson Co. (Control Section 22012)	NA	M 95, NB M 95, SB	BA BA	0.28 0.23
M 95 South of Sagola for a distance of 0.19 miles (Control Section 22012)	NA	M 95, NB M 95, SB	BA BA	0.56 0.53
Houghton County				
M 203 (Quincy) from Anthony Ave southeast to US 41 (Lincoln Ave) in Hancock (Control Section 31051)	NA	M 203, EB M 203, WB	BA BA	0.48 0.48
US 41 from south of Pilgrim River south 4.151 miles (Control Section 31051)	NA	US 41, NB US 41, SB	BA BA	0.47 0.31
US 41 (eastbound) 0.6 mile on Hancock St. in Hancock (Control Section 31052)	NA	US 41, EBOL US 41, EBIL	BA BA	0.38 0.34
Iron County				
M 73 and M 189 - 24 locations from Michigan-Wisconsin State Line northerly to US 2 in Iron Co. (Control Sections 36011 and 36031)	NA	M 73, NB M 73, SB M 189, NB M 189, SB M 189, SB	NSST NSST NSST NSST NSST	0.60 0.67 0.60 0.43 ⁽¹⁾ 0.61 ⁽¹⁾ 0.46 ⁽¹⁾
US 2 from Iron River to Crystal Falls (Control Section 36022)	NA	US 2, EB US 2, EB ⁽²⁾ US 2, WB US 2, WB ⁽²⁾	BA BA BA BA	0.64 ⁽³⁾ 0.58 ⁽³⁾ 0.55 ⁽³⁾ 0.54 ⁽³⁾
Marquette County				
M 35 from Little Lake to South County Line of Marquette Co. (Control Section 52031)	NA	M 35, NB M 35, SB	BA BA	0.65 0.68
M 35 from County Rd REA Easterly 1/2 mile (Control Section 52032)	NA	M 35, NB M 35, SB	BA BA	0.44 0.39

Location	1987 Accidents		Surface Type	Average Coefficient
	Wet Surface	Total		
Marquette County Cont.				
US 41 - US 41 BR (Washington) @ Fourth, in Marquette (Control Section 52044)	NA	US 41 - US 41 BR, EB US 41 - US 41 BR, WB	BC BC	0.27 0.45
US 41 - M 28 (Front St) @ Washington, in Marquette (Control Section 52044)	NA	US 41 - M 28, NBOL US 41 - M 28, NBIL US 41 - M 28, EB	BC BC BC	0.45 0.46 0.46
M 28 from Junction @ US 41 to east Co. Line (Control Section 52081)	NA	M 28, EB M 28, WB	BA BA	0.58 0.61
Menominee County				
US 41 from 10th St Southwesterly to Interstate Bridge, in Menominee (Control Section 55011)	NA	US 41, EBOL US 41, EBIL US 41, WBOL US 41, WBIL	CONC CONC CONC CONC	0.40 0.44 0.46 0.39
US 41 from South Limits of Stephenson Northerly for 1 mile (Control Section 55012)	NA	US 41, NB US 41, SB	CONC CONC	0.49 0.46
Ontonagon County				
M 64 from Mineral River to M 107 in Ontonagon Co. (Control Section 66012)	NA	M 64, EB M 64, WB	BA BA	0.50 0.59
M 64 from Ontonagon West (Control Section 66013)	NA	M 64, EB M 64, WB	BA BA	0.46 0.46
M 28 from West of Baltimore River East to East of US 45 in Ontonagon Co. (Control Section 66022)	NA	M 28, EB M 28, WB	BA BA	0.18 0.23
US 41 from the Northern County Line of Baraga South for 8-1/2 miles (Control Section 07013)				
US 2 intermittent locations from Jackson Creek (southeast of Wakefield) southeasterly to Slide River (northwest of Coeptic Station) (Control Section 27022)				
M 28 from southeast of Lake Linden north 3.36 miles (Control Section 31013)				
US 41 - M 28 @ Hampton, in Marquette (Control Section 52042)				
Construction was not complete enough at the above four locations to warrant skid tests.				

DISTRICT 1 (CONT)

(1) Tracked with oil.
(2) Special lane on hill for slow moving vehicles.
(3) Tests conducted during 1987 test year.

TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1987 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
DISTRICT 2					
<u>Chippewa County</u>					
BS 75 (Ashmun St) @ Easterday, in Sault Ste. Marie (Control Section 17032)	NA		BS 75, NB BS 75, SB	BA BA	0.39 0.38 ^(*)
<u>Delta County</u>					
US 2 from Escanaba River Southerly 1/2 mile in Delta County (Control Section 21022)	NA		US 2, NBOL US 2, NBIL US 2, SBOL US 2, SBIL	CONC CONC CONC CONC	0.38 0.50 0.42 0.53
<u>Benzie County</u>					
US 31 from 1/4 mi west to 1/2 mi east of Reynolds Rd, in Benzie Co. (Control Section 10032)	NA		US 31, EB US 31, EB US 31, WB	BC BC BC	0.43 0.41 ^(*) 0.45
US 31 from 1/4 mi west to 1/2 mi east of Carmien Rd, in Benzie Co. (Control Section 10032)	NA		US 31, EB US 31, WB	BC BC	0.30 0.27
<u>Leelanau County</u>					
M 72 @ Curve with inter-section of County Road #669 (1/4 mi each direction from County Rd #669) in Kalamazoo County (Control Section 45021)	NA		M 22 (North Jct), EB M 22 (North Jct), WB M 22 (South Jct), EB M 22 (South Jct), WB	BC ^(*) BC ^(*) BC ^(*) BC ^(*)	0.37 0.33 0.35 0.37
<u>Wexford County</u>					
M 115 from 1/4 mi south-east to 1/2 mi northwest of Boon Rd (3/4 mi) Wexford Co (Control Section 83032)	NA		M 115, EB M 115, WB M 115, EB M 115, WB	BA BA CONC CONC	0.50 0.54 0.33 0.32
M 115 from 1/4 mi south-east of 19-1/2 Mile Rd to 1/4 mi northwest of 20 Mile Rd, Wexford Co. (Control Section 83032)	NA		M 115, EB M 115, WB	CONC CONC	0.28 0.33
DISTRICT 3					
<u>Alpena County</u>					
US 23 - M 32 at 1st St. in Alpena (Control Sections 04031 and 04032)	13		US 23, NBOL US 23, NBIL US 23, SB M 32, EB	BC BC BC BC	0.37 0.43 0.38 0.42
US 23 (Chisholm) at 11th in Alpena (Control Section 04032)	15		US 23, NB US 23, SB	BC BC	0.41 0.34
DISTRICT 4					
<u>Alpena County</u>					
US 23 - M 32 at 1st St. in Alpena (Control Sections 04031 and 04032)	13		US 23, NBOL US 23, NBIL US 23, SB M 32, EB	BC BC BC BC	0.37 0.43 0.38 0.42
US 23 (Chisholm) at 11th in Alpena (Control Section 04032)	15		US 23, NB US 23, SB	BC BC	0.41 0.34
DISTRICT 5					
<u>Isabella County</u>					
US 27ER (Mission) at Below in Mt. Pleasant (Control Section 37011)	28		US 27ER, NBOL US 27ER, NBIL US 27ER, SBOL US 27ER, SBIL	CONC CONC CONC CONC	0.22 0.33 0.32 0.32
US 27ER (Mission) at High in Mt. Pleasant (Control Sections 37011 and 37012)	23		US 27ER, NBOL US 27ER, NBIL US 27ER, SBOL US 27ER, SBIL M 20, EB	CONC CONC CONC CONC BC	0.31 0.33 0.31 0.33 0.29
US 27ER (Mission) at Broadway in Mt. Pleasant (Control Section 37012)	20		US 27ER, NBOL US 27ER, NBIL US 27ER, SBOL US 27ER, SBIL	CONC CONC CONC CONC	0.33 0.34 0.33 0.33
US 27ER (Mission) at Picked in Mt. Pleasant (Control Section 37012)	21		US 27ER, NBOL US 27ER, NBIL US 27ER, SBOL US 27ER, SBIL M 20, WB	CONC CONC CONC CONC BC	0.35 0.35 0.36 0.37 0.34
<u>Kent County</u>					
US 131BR (Division) at Pearl in Grand Rapids (Control Section 41014)	91		US 131BR, NBOL US 131BR, NBIL US 131BR, SBOL US 131BR, SBIL	BC BC BC BC	0.42 0.41 0.38 0.37
US 131BR - M 45 - M 21BR (Fulton) at Division in Grand Rapids (Control Sections 41014 and 41022)	44		US 131BR - M 45 - M 21BR M 21BR, NBOL Same, NBOL Same, NBIL Same, SBOL Same, SBIL Same, EBOL Same, EBIL Same, WBOL Same, WBIL	BC BC BC BC BC BC BC BC BC BC	0.36 0.35 0.34 0.33 0.33 0.41 0.40 0.39 0.42
I 96 Ramps (exit and entrance) at Plainfield in Grand Rapids (Control Section 41025)	87		I 96, WB ent. I 96, WB exit I 96, EB ent. I 96, EB exit	CONC CONC CONC CONC	0.31 0.45 0.50 0.30
DISTRICT 4 (CONT.)					
<u>Chippewa County</u>					
M 27 (Main) at Division in Cheboygan (Control Section 16032)	16		M 27, NB M 27, SB	BC BC	0.30 0.27
US 23 (MacKizaw) at M 27 (Main) in Cheboygan (Control Section 16038)	18		US 23, EB US 23 - M 27, NB	CONC BC	0.35 0.33

(*) Rt edge (approx. 4 ft) surface treated.
(e) K & S Treatment has been worn off.

TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

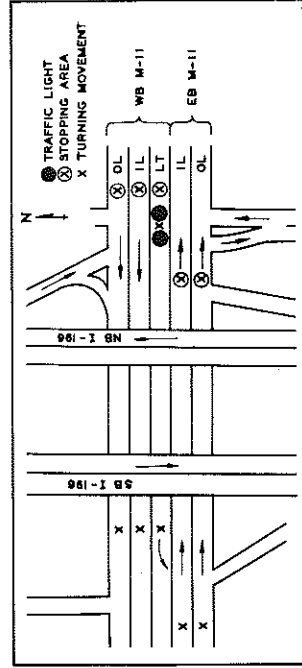
Location	1987 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
<u>Kent County Cont.</u>					
M 11 (Wilson) at I 196 Ramps in Grandville (Control Section 41061)	23		M 11 (stopping area, EBOL ^(*)) Same, EBIL Same, WBOL Same, WBIL Same, WBELT M11 (turning movement), EBOL Same, EBIL Same, WBOL Same, WBIL Same, WBELT	CONC CONC CONC CONC ST BC BC CONC CONC CONC ST	0.33 0.32 0.32 0.30 0.37 0.40 0.46 0.37 0.40 0.32
M 11 (28th St.) at Byron Center Ave in Wyoming (Control Section 41062)	37		M 11, EBOL M 11, EBIL M 11, WBOL M 11, WBIL	CONC CONC CONC BA	0.30 0.33 0.29 0.30
M 11 (28th St.) at Burton-Agamé in Wyoming (Control Section 41062)	56		M 11, EBOL M 11, EBIL M 11, WBOL M 11, WBIL	CONC CONC CONC EA	0.30 0.29 0.30 0.20
M 11 (28th St.) at Division in Wyoming and Grand Rapids (Control Sections 41062 and 41063)	114		M 11, EBOL M 11, EBIL M 11, WBOL M 11, WBIL	BA BA BA BA	0.31 0.33 0.33 0.36
US 131 at 44th St. in Wyoming (Control Section 41131)	32		US 131, NBOL ^(*) US 131, NBIL US 131, SBOL US 131, SBIL US 131, NB ramp US 131, SBOL US 131, SBIL US 131, SBOL ramp US 131, SBIL ramp	CONC CONC CONC CONC CONC CONC CONC CONC CONC	0.41 0.48 0.43 0.47 0.45 0.41 0.38
US 131 at 32nd St. in Wyoming (Control Section 41131)	28		US 131, NBOL ^(*) US 131, NBIL US 131, SBOL US 131, SBIL US 131, NBOL ramp US 131, NBIL ramp US 131, SBOL ramp US 131, SBIL ramp	CONC CONC CONC CONC CONC CONC CONC CONC	0.41 0.45 0.38 0.45 0.46 0.44 0.41 0.37
US 131 at Burton in Grand Rapids (Control Section 41131)	111		US 131, NBOL ^(*) US 131, NBIL US 131, SBOL US 131, SBCL US 131, SBIL US 131, NBOL ramp US 131, NBIL ramp Ramp stopping area at Century, SB	CONC CONC CONC CONC CONC CONC CONC CONC	0.37 0.37 0.46 0.37 0.37 0.41 0.40 0.38

DISTRICT 5 (CONT.)

Location	1987 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
<u>Kent County Cont.</u>					
US 131 at Hall in Grand Rapids (Control Section 41131)	81		US 131, NBOL ^(*) US 131, NBCL US 131, NBIL US 131, SBOL US 131, SBCL US 131, SBIL US 131, NBOL ramp US 131, NBIL ramp Ramp at curve before stopping area at Century, SBOL Same, EBIL	CONC CONC CONC CONC CONC CONC CONC CONC CONC CONC	0.34 0.36 0.41 0.36 0.37 0.40 0.42 0.44
US 131 at Franklin in Grand Rapids (Control Section 41131)	61		US 131, NBOL ^(*) US 131, NBCL US 131, NBIL US 131, SBOL US 131, SBCL US 131, SBIL US 131, NBOL ramp US 131, NBIL ramp Ramp stopping area at Century, SB	CONC CONC CONC CONC CONC CONC CONC CONC CONC	0.37 0.37 0.41 0.35 0.37 0.41 0.43 0.41
US 131 at Wealthy in Grand Rapids (Control Section 41131)	109		US 131, NBOL ^(*) US 131, NBCL US 131, NBIL US 131, SBOL US 131, SBCL US 131, SBIL US 131, NBOL ramp US 131, NBIL ramp US 131, SBOL ramp US 131, SBOL ramp US 131, SBIL ramp	CONC CONC CONC CONC CONC CONC CONC CONC CONC CONC CONC	0.33 0.36 0.37 0.29 0.29 0.29 0.38 0.41 0.45 0.34

DISTRICT 5 (CONT.)

(*) See Schematic 1.
(*) Tests taken on US 131 prior to each exit and also on the ramp approach to traffic signal of the intersecting roadway for both directions.



Schematic 1. High-accident test location showing M 11 (Wilson) at I 196. (Control Section 41061).

TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1967 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
<u>Muskegon County</u>					
M 37 from 18 Mile Rd. W to jct of M 37 and M 46 in Muskegon County (Control Section 61024)	NA	NA	M 37, EB M 37, WB	BC BC	0.35 0.36
US 31 at Exit Ramps to Lakeston Ave. in Muskegon (Control Section 61072)	NA	NA	US 31, NBOL US 31, NBIL US 31, SBOL US 31, SBIL	CONC CONC CONC CONC	0.37 0.36 0.39 0.53
US 31 at Exit Ramps approaching intersection with M 20 in Muskegon (Control Section 61075)	NA	NA	US 31, NBOL US 31, NBCL US 31, NBIL US 31, SBOL US 31, SBIL	CONC CONC CONC CONC CONC	0.37 0.45 0.56 0.40 0.58
US 31BR (Seaway Dr.) at Southern in Muskegon (Control Section 61151)	29	29	US 31BR, NBOL US 31BR, NBIL US 31BR, SBOL US 31BR, SBIL	CONC CONC CONC CONC	0.34 0.37 0.33 0.37
US 31BR (Seaway Dr.) at Marquette in Muskegon (Control Section 61153)	21	21	US 31BR, NBOL US 31BR, NB#3 US 31BR, NB#2 US 31BR, NBIL US 31BR, SBOL US 31BR, SB#3 US 31BR, SB#2 US 31BR, SBIL	BC BC BC BC BC BC BC BC	0.32 0.28 0.31 0.32 0.32 0.32 0.32 0.33
US 31BR (Seaway Dr.) at M 20 intersection in Muskegon (Control Section 61153)	35	35	1, OL(e) 2, OL 3, OL 4, OL 5, OL 6, CL	BC BC BC BC BC BC	0.29 0.25 0.28 0.34 0.30 0.35 0.34 0.31 0.44 0.38 0.43
<u>Ottawa County</u>					
US 31BR (Michigan) at 32nd St. in Holland (Control Section 70011)	41	41	US 31BR, NBOL US 31BR, NBIL US 31BR, SBOL US 31BR, SBIL	BC BC BC BC	0.30 0.30 0.33 0.30
US 31BR-M 21 (8th St.) at River St. in Holland (Control Sections 70011 and 70012)	40	40	US 31BR (River), NBOL Same, NBIL US 31BR (8th), SBOL Same, SBIL	BC BC BC BC BC	0.42 0.41 0.39 0.37
<u>DISTRICT 5 (CONT.)</u>					
<u>Chawara County Cont.</u>					
US 31 By-pass at 18th St. in Holland (Control Section 70012)	21	21	US 31, NBOL US 31, NBIL US 31, SBOL US 31, SBIL	CONC CONC CONC CONC	0.35 0.46 0.38 0.46
US 31 at Jackson St. in Grand Haven (Control Section 70014)	29	29	US 31, NBOL US 31, NB#3 US 31, NB#2 US 31, NBIL US 31, SBOL US 31, SBCL US 31, SBIL	CONC CONC CONC CONC CONC CONC CONC	0.35 0.37 0.43 Not tested 0.34 0.37 0.41
US 31 at Washington in Grand Haven (Control Section 70014)	27	27	US 31, NBOL US 31, NBIL US 31, SBOL US 31, SBIL	CONC CONC CONC CONC	0.36 0.44 0.35 0.39
<u>DISTRICT 6</u>					
<u>Bay County</u>					
M 13 (Broadway) at I 75BL (Ladayette) in Bay City (Control Section 09031)	13	13	M 13, NBOL M 13, NBIL I 75BL, EBOL I 75BL, EBIL I 75BL, WBOL I 75BL, WEIL	BC BC SA SA BC BC	0.40 0.33 0.39 0.34 0.30 0.26
I 75 - US 23 just prior to ramp from NB I 75 to WB US 10 in Bay County (Control Section 09035)	NA	NA	I 75 - US 23, NBOL I 75 - US 23, NBIL I 75 - US 23, NBIL I 75 - US 23, NBIL	CONC CONC CONC CONC	0.36 0.58
M 25 (7th) at Saginaw in Bay City (Control Section 09051)	35	35	M 25, WBOL M 25, WBCL M 25, WEIL	CONC CONC CONC	0.34 0.31 0.36
M 25 (Center) at M 25 (Madison) in Bay City (Control Section 09051)	12	12	M 25, NBOL M 25, NBIL M 25, WBOL M 25, WEIL	BC BC BC BC	0.37 0.38 0.28 0.29
US 10 just prior to ramp from EB US 10 to SB I 75 and along entire ramp length in Bay County (Control Section 09101)	NA	NA	US 10 (prior to ramp) Same, EBCL Same, EBIL I 75 - US 10 (on ramp), SBOL Same, SBIL	BC BC BC BC BC	0.41 0.51 0.50 0.44 0.52
<u>Genesee County</u>					
M 54BR (Saginaw) at 5th St. in Flint (Control Section 25051)	21	21	M 54BR, NBOL M 54BR, NBIL M 54BR, SBOL M 54BR, SBIL	BC BC BRICK BRICK	0.34 0.38 0.28 0.28

(e) See Schematic 2.

Schematic 2. 1968 high-accident test location showing US 31 BR (Seaway Dr) at M 20 intersection, in Muskegon. (Control Section 61153).

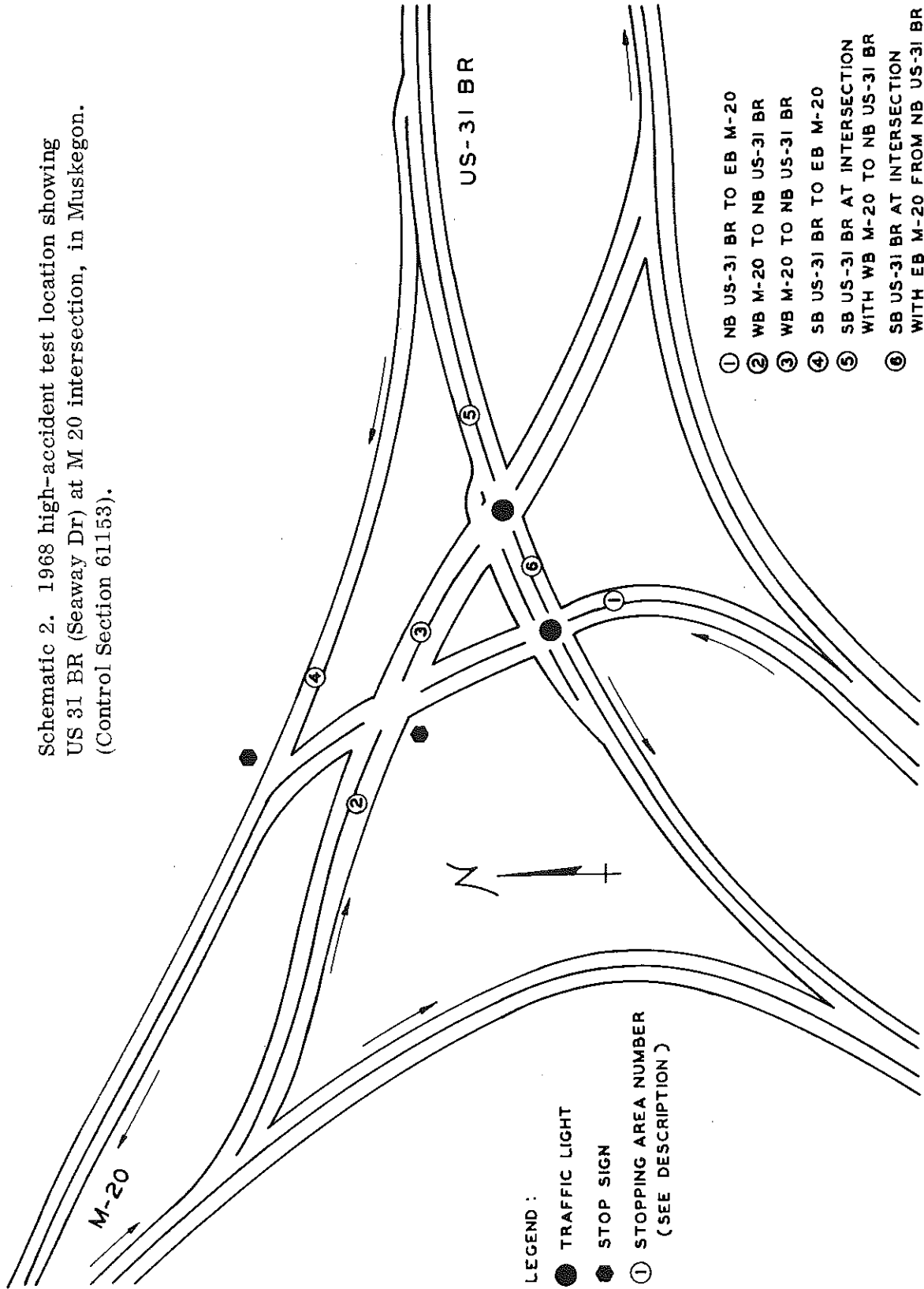


TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1987 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
<u>Berrien County Cont.</u>					
BL 94 (Main St) @ Sixth St, in Benton Harbor (Control Section 11013)	19		BL 94, EBOL BL 94, EBIL BL 94, WBOL BL 94, WBIL	CONC CONC CONC CONC	0.35 0.32 0.32 0.34
BL 94 (Main St) @ River-view, in Benton Harbor (Control Section 11013)	27		BL 94, EBOL BL 94, EBIL BL 94, WBOL BL 94, WBIL	CONC CONC CONC CONC	0.38 0.35 0.34 0.38
US 31 - US 33 (Main St) @ Fifth St, in Niles (Control Section 11041) & M 40 (Fifth St) @ US 31 - US 33 (Main St), in Niles (Control Section 11091)	21		US 31 - US 33, NBOL US 31 - US 33, NBIL US 31 - US 33, SBOL US 31 - US 33 SBIL	CONC CONC CONC CONC CONC CONC	0.27 0.26 0.26 0.27 0.29 0.28
US 31 - US 33 (Main St) @ Third St, in Niles (Control Section 11041)	19		US 31 - US 33, NBOL US 31 - US 33 NBIL US 31 - US 33 SBOL US 31 - US 33 SBIL	CONC CONC CONC CONC CONC CONC	0.24 0.27 0.25 0.28
US 31 - US 33 (Main St) @ Second St, in Niles (Control Section 11041)	19		US 31 - US 33, NBOL US 31 - US 33, NBIL US 31 - US 33, SBOL US 31 - US 33, SBIL	CONC CONC CONC CONC CONC CONC	0.24 0.28 0.27 0.29
US 31 - US 33 (11th St) @ Silverbrook, in Niles (Control Section 11051)	25		US 31 - US 33, NBOL US 31 - US 33, NBIL US 31 - US 33, SBOL US 31 - US 33, SBIL	CONC CONC CONC CONC CONC CONC	0.26 0.30 0.27 0.37
BL 94 (Main St) @ Ship St in St. Joseph (Control Section 11053)	21		BL 94, NBOL BL 94, NBIL BL 94, SBOL BL 94, SBIL	CONC CONC CONC CONC	0.32 0.38 0.37 0.37
M 40 (6th St) @ Wayne St, in Niles (Control Section 11051)	28		M 40, NB M 40, EB	CONC CONC	0.32 ⁽¹⁰⁾ 0.34 ⁽¹⁰⁾ 0.34 ⁽¹⁰⁾

DISTRICT 7 (CONT)

(10) Road alignment prevents reliable testing.
(11) Last 40 ft of stopping area.

Location	1987 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
<u>Calhoun County</u>					
M 66 (Capital) @ Union St, in Battle Creek (Control Section 13032)	34		M 66, NBRT M 66, NBIL M 66, SBIL	BC BC BC	0.29 0.24 0.25
M 66 (Capital) @ Emmet St, in Battle Creek (Control Section 13032)	36		M 66, NB M 66, SB	BC BC	0.29 0.24
M 66 (Capital) @ Maple Grove, in Battle Creek (Control Section 13032)	NA		M 66, NB M 66, SB	BC BC	0.31 0.25
M 99 (Superior) from Erie to Michigan, in Albion (Control Section 13043)	NA		M 99, NBOL M 99, NBIL M 99, SBOL M 99, SBIL	BRICK BRICK BRICK BRICK	0.23 0.18 0.18 0.16
M 89 (Michigan Ave) @ M 37 (Bedford Ave) in Battle Creek (Control Section 13061)	37		M 89, EBOL M 89, EBIL M 89, WBOL M 89, WBIL M 37, SBOL M 37, SBIL	BC BC BC BC CONC BC	0.33 0.30 0.33 0.33 0.37 0.25
M 37 (Michigan Ave) @ Angel St, in Battle Creek (Control Section 13061)	26		M 37, EBRT M 37, EBIL Mich Ave, WBRT Mich Ave, WBIL	BC BC BC BC	0.30 0.30 0.31 0.27
BL 94 (Dickman) @ Capital Ave, in Battle Creek (Control Section 13121)	49		BL 94, EBOL BL 94, EBIL BL 94, WBOL BL 94, WBIL	BA BA CONC CONC	0.34 0.41 0.32 0.40
<u>Cass County</u>					
M 60 @ Pine Lake Rd (Control Section 14061)	NA		M 60, EB M 60, EB M 60, WB	NSST BC NSST	0.34 0.28 0.35
<u>Kalamazoo County</u>					
BL 94 (Stadium Rd) @ Lovell, in Kalamazoo (Control Section 39041)	22		BL 94, EBOL ⁽¹¹⁾ BL 94, EBIL BL 94, EBIL ⁽¹¹⁾ BL 94, WBOL BL 94, WBIL	BC BC BC BC BC	0.32 0.21 0.36 0.22 0.28 0.28
BL 94 (Stadium Rd) @ South St, in Kalamazoo (Control Section 39041)	42		BL 94, EBOL BL 94, EBIL BL 94, WBOL BL 94, WBIL	BC BC BC BC	0.23 0.24 0.24 0.24
BL 94 (Michigan Ave) @ Park St, in Kalamazoo (Control Section 39042)	38		BL 94, EBOL BL 94, EB#4 BL 94, EB#3 BL 04, EB#2 BL 94, EBIL	BC BC BC BC BC	0.23 0.27 0.28 0.26 0.25

DISTRICT 7 (CONT)

TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1987 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
<u>Kalamazoo County Cont.</u>					
BL 94 (Michigan Ave) @ Main St. in Kalamazoo (Control Sections 39042 & 39081)	42		BL 94 (Michigan Ave) EBOL BL 94 (Michigan Ave) EBOL BL 94 (Michigan Ave) EBOL BL 94 (Michigan Ave) EBOL BL 94 (Michigan Ave) WBOL BL 94 (Michigan Ave) WBOL BL 94 (Michigan Ave) WBOL M 43 (Main St) EBOL M 43 (Main St) EBOL M 43 (Main St) EBOL M 43 (Riverview) NBEOL M 43 (Riverview) NBEOL M 43 (Riverview) NBEOL M 43 (Gull Rd) WBOL M 43 (Gull Rd) WBOL	BC BC BC BC CONC CONC CONC BC BC BC BC BC BC BC BC	0.21 0.20 0.25 0.34 0.30 0.39 0.24 0.23 0.22 0.29 0.30 0.36 0.36 0.38
M 43 (Gull Rd) @ River-view, in Kalamazoo (Control Section 39082)	33		M 43 (Riverview) NBEOL M 43 (Riverview) NBEOL M 43 (Riverview) NBEOL M 43 (Gull Rd) WBOL M 43 (Gull Rd) WBOL	BC BC BC BC BC	0.31 0.32 0.35 0.39 0.36 0.39
<u>St. Joseph County</u>					
US 131 (Washington) @ Junction with White Pigeon, in Constatwhe (Control Section 78012)	NA		US 131, NB US 131, SB	BC BC	0.33 0.33
<u>Livingston County</u>					
1 96 @ 1000 ft on each side of Flint Rd overpass, Brighton Twp, Livingston Co. (Control Section 47068)	NA		1 96 (E of Flint Rd), EBOL 1 96 (E of Flint Rd), EBOL 1 96 (E of Flint Rd), WBOL 1 96 (E of Flint Rd), WBOL 1 96 (W of Flint Rd), EBOL 1 96 (W of Flint Rd), EBOL 1 96 (W of Flint Rd), WBOL 1 96 (W of Flint Rd), WBOL	CONC CONC CONC CONC CONC CONC CONC CONC	0.38 0.59 0.38 0.55 0.45 0.50 0.38 0.50
<u>Macomb County</u>					
M 53 (Van Dyke) at Toepfer in Warren (Macomb County) (Control Section 50011)	NA		M 53, NBOL M 53, NBOL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL	BC BC BC BC BC BC BA BA BA BA BA BA BA BA BA	0.31 0.31 0.34 0.31 0.33 0.34 0.33 0.34 0.35 0.33 0.35 0.37 0.31 0.32 0.35 0.39 0.36 0.39
M 53 (Van Dyke) at Westmeier in Warren (Control Section 50011)	22		M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL	BA BA BA BA BA BA BA BA BA BA BA BA BA BA BA	0.33 0.34 0.35 0.33 0.35 0.37 0.31 0.32 0.35 0.39 0.36 0.39 0.35 0.36 0.37
M 53 (Van Dyke) at 9 Mile in Warren (Control Section 50011)	16		M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL	BA BA BA BA BA BA BA BA BA BA BA BA BA BA BA	0.31 0.32 0.35 0.39 0.36 0.39 0.35 0.36 0.37 0.31 0.32 0.35 0.39 0.36 0.39
M 53 (Van Dyke) at 10 Mile in Center Line (Control Section 50011)	61		M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL	BA BA BA BA BA BA BA BA BA BA BA BA BA BA BA	0.35 0.36 0.37 0.34 0.36 0.38 0.37 0.35 0.35 0.38 0.37 0.34 0.36 0.37
M 53 (Van Dyke) at Engelman in Center Line (Control Section 50011)	20		M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL	BA BA BA BA BA BA BA BA BA BA BA BA BA BA BA	0.36 0.35 0.35 0.38 0.37 0.34 0.36 0.35 0.35 0.38 0.37 0.34 0.36 0.37
M 53 (Van Dyke) at 11 Mile in Center Line (Control Section 50011)	21		M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL	BA BA BA BA BA BA BA BA BA BA BA BA BA BA BA	0.36 0.38 0.39 0.38 0.38 0.37 0.36 0.35 0.35 0.38 0.37 0.34 0.36 0.37
M 53 (Van Dyke) at 12 Mile in Warren (Control Section 50011)	68		M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL	BA BA BA CONC CONC CONC CONC BA BA BA CONC CONC CONC CONC	0.35 0.37 0.37 0.27 0.30 0.33 0.33 0.34 0.35 0.38 0.37 0.34 0.36 0.37
M 53 (Van Dyke) at 13 Mile in Warren (Control Section 50011)	28		M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL M 53, NBOL M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBOL M 53, SBIL M 53, SBIL	CONC CONC CONC CONC CONC CONC CONC CONC CONC CONC CONC CONC CONC CONC	0.34 0.33 0.36 0.33 0.33 0.32 0.33 0.34 0.35 0.38 0.37 0.34 0.36 0.37

DISTRICT 9

DISTRICT 7 (CONT.)

DISTRICT 8

TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1967 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
Macomb County Cont.					
M 53 (Van Dyke) at Chicago in Warren (Control Section 50011)	23		M 53, NBOL M 53, NBCL M 53, NBIL M 53, SBOL M 53, SBCL M 53, SBIL	CONC CONC CONC CONC CONC CONC	0.34 0.35 0.32 0.32 0.30 0.29
M 53 (Van Dyke) at 14 Mile in Sterling Twp. (Control Section 50011)	21		M 53, NBOL M 53, NBCL M 53, NBIL M 53, SBOL M 53, SBCL M 53, SBIL	CONC CONC CONC BA BA	0.31 0.34 0.29 0.31 0.32 0.32
M 53 (Van Dyke) at 15 Mile in Sterling Twp. (Control Section 50011)	36		M 53, NBOL M 53, NBCL M 53, NBIL M 53, SBOL M 53, SBCL M 53, SBIL	BA BA BA BA BA BA	0.38 0.31 0.34 0.36 0.32 0.34
M 53 (Van Dyke) at 16-1/2 Mile in Sterling Twp. (Control Section 50011)	27		M 53, NBOL M 53, NBIL M 53, SBOL M 53, SBCL M 53, SBIL	BA BA CONC CONC CONC	0.42 0.43 0.31 0.32 0.31
M 97 (Groesbeck) at Toepfer in Warren (Control Section 50031)	23		M 97, NBOL M 97, NBIL M 97, SBOL M 97, SBIL	CONC CONC CONC CONC	0.31 0.33 0.36 0.34
M 97 (Groesbeck) at 9 Mile in Warren (Control Section 50031)	26		M 97, NBOL M 97, NBIL M 97, SBOL M 97, SBIL	BC BC BC BC	0.41 0.43 0.42 0.44
M 97 (Groesbeck) at Schoenherr in Warren (Control Section 50031)	35		M 97, NBOL M 97, NBIL M 97, SBOL M 97, SBIL	CONC CONC CONC CONC	0.33 0.30 0.32 0.30
M 97 (Groesbeck) at 10 Mile in Warren (Control Section 50031)	30		M 97, NBOL M 97, NBIL M 97, SBOL M 97, SBIL	BC BC BC BC	0.40 0.42 0.41 0.41
M 97 (Groesbeck) at 11 Mile in Warren (Control Section 50031)	20		M 97, NBOL M 97, NBIL M 97, SBOL M 97, SBIL	BC BC BC BC	0.38 0.41 0.40 0.40
M 97 (Groesbeck) at Common in Roseville (Control Section 50031)	25		M 97, NBOL M 97, NBIL M 97, SBOL M 97, SBIL	SA SA SA SA	0.47 0.52 0.46 0.52
M 97 (Groesbeck) at 13 Mile in Clinton Twp. (Control Section 50031)	35		M 97, NBOL M 97, NBIL M 97, SBOL M 97, SBIL M 97, SB#2	SA BA BA BA BA	0.45 0.38 0.41 0.46 0.39 0.42

DISTRICT 9 (CONT.)

Location	1967 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
Macomb County Cont.					
M 97 (Groesbeck) at Metro Parkway in Mt. Clemens (Control Section 50031)	30		M 97, NBOL M 97, NBIL M 97, SBOL M 97, SBIL	SA SA SA SA	0.30 0.32 0.49 0.32
M 97 (Groesbeck) at Harrington in Mt. Clemens (Control Section 50031)	22		M 97, NBOL M 97, NBIL M 97, SBOL M 97, SBIL	SA SA SA SA	0.30 0.31 0.48 0.33
US 25 (Gratiot) at Metro Parkway in Clinton Twp. (Control Section 50051)	31		US 25, NBOL US 25, NBIL US 25, SBOL US 25, SBOL US 25, SBIL US 25, SBIL	CONC CONC BC CONC BC CONC	0.31 0.29 0.56 0.29 0.42 0.32
US 25 (Gratiot) at Cass in Mt. Clemens (Control Section 50051)	24		US 25, NBOL US 25, NB#3 US 25, NB#2 US 25, NBIL US 25, SBOL US 25, SB#3 US 25, SB#2 US 25, SBIL	CONC CONC CONC CONC SA SA SA SA	0.41 0.39 0.40 0.41 0.53 0.52 0.46 0.49
Oakland County					
I 96 - Ck/ORR near Novi Rd. in Novi (Oakland County) (Control Section 63022)	NA		I 96, EROL I 96, ERCL I 96, EBL I 96, WBOL I 96, WBCL I 96, WEIL	CONC CONC CONC CONC CONC CONC	0.35 0.40 0.40 0.39 0.43 0.43
US 24 (Telegraph) at E. Quarron (16 Mile) (Oakland County) (Control Section 63031)	NA		US 24, NBOL US 24, NBIL US 24, SBOL US 24, SBIL	CONC BC CONC CONC	0.33 0.44 0.34 0.38
M 59 at Milford Rd. (Oakland County) (Control Section 63041)	NA		M 59, EB M 59, WB	BC BC	0.41 0.38
M 59 at Voorheis Rd. (Oakland County) (Control Section 63041)	NA		M 59, EBOL M 59, EBIL M 59, WBOL M 59, WBIL	BA BA BA BA	0.34 0.35 0.32 0.33
M 59 at Elizabeth Lake Rd. (Oakland County) (Control Section 63041)	NA		M 59, EBOL M 59, EBIL M 59, WBOL M 59, WBIL	BC BC BC BC	0.35 0.38 0.35 0.36
US 10 (Hunter Blvd) at Forest in Birmingham (Control Section 63051)	36		US 10, NBOL US 10, NB#3 US 10, NB#2 US 10, NBIL US 10, SBOL US 10, SB#3 US 10, SB#2 US 10, SBIL	BA BA BA BA BA BA BA BA	0.43 0.43 0.44 0.45 0.40 0.44 0.44 0.45

DISTRICT 9 (CONT.)

TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1967 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
Oakland County Cont.					
US 10 (Hunter Blvd) at Maple in Birmingham (Control Section 63051)	26		US 10, NBOL US 10, NB#3 US 10, NB#2 US 10, NBIL US 10, SBOL US 10, SE#3 US 10, SE#2 US 10, SEIL	BA BA BA BA BA BA BA BA	0.38 0.38 0.41 0.41 0.39 0.41 0.40 0.46
US 10 (Woodward) at signalized left-turn cross-over north of 13 Mile in Royal Oak (Control Section 63051)	--		US 10, SBOL US 10, SE#3 US 10, SE#2 US 10, SEIL	BA BA BA BA	0.35 0.38 0.40 0.40
US 10 (Woodward) at Signalized left-turn cross-over north of 12 Mile in Royal Oak (Control Section 63051)	--		US 10, SBOL US 10, SE#3 US 10, SE#2 US 10, SEIL	BA BA BA BA	0.36 0.37 0.38 0.39
US 10 (Woodward) at Coolidge Hwy in Royal Oak (Control Section 63051)	44		US 10, NBOL US 10, NB#3 US 10, NB#2 US 10, NBIL US 10, SBOL US 10, SE#3 US 10, SE#2 US 10, SEIL	BA BA BA BA BA BA BA BA	0.37 0.38 0.38 0.38 0.40 0.41 0.42 0.43
US 10 (Woodward) at 13 Mile in Royal Oak (Control Section 63051)	64		US 10, NBOL US 10, NB#3 US 10, NB#2 US 10, NBIL US 10, SBOL US 10, SE#3 US 10, SE#2 US 10, SEIL	BA BA BA BA BA BA BA BA	0.37 0.38 0.39 0.39 0.40 0.41 0.42 0.41
US 10 (Dobie Hwy) at Walton Blvd (Oakland County) (Control Section 63053)	NA		US 10, NBOL US 10, NBIL US 10, SBOL US 10, SEIL	SA SA SA SA	0.47 0.46 0.41 0.45
US 10 (Dobie Hwy) at Watkins Lake Rd. (Oakland County) (Control Section 63053)	NA		US 10, NBOL US 10, NBIL US 10, SBOL US 10, SEIL	BC BC BC BC	0.42 0.46 0.42 0.47
US 10 (Dobie Hwy) at Andersonville Rd. (Oakland County) (Control Section 63053)	NA		US 10, NBOL US 10, NBIL US 10, SBOL US 10, SEIL	SA SA SA SA	0.42 0.48 0.39 0.43
I 696BS (Northwestern) Service Rds at Evergreen in Southfield (Control Section 63081)	44		I 696BS, NBOL I 696BS, NBIL I 696BS, SBOL I 696BS, SEIL	BA BA BA BA	0.39 0.37 0.51 0.44

DISTRICT 9 (CONT)

Location	1967 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
Oakland County Cont.					
BL 75 (Perry) at Glenwood in Pontiac (Control Section 63091)	34		BL 75, NBOL BL 75, NBIL BL 75, SBOL BL 75, SEIL	BA BA BA BA	0.37 0.38 0.40 0.38
BL 75 (Perry) at Montcalm and East in Pontiac (Control Section 63091)	41		BL 75, NBOL BL 75, NBIL BL 75, SBOL BL 75, SEIL	BA BA CONC CONC	0.36 0.37 0.28 0.31
I 696 WB under Haggerty Rd. in Novi (Oakland County) (Control Section 63101)	NA		I 696, WBOL I 696, WBIL	CONC CONC	0.35 0.41
M 24 at Flint St. City of Lake Orion (Control Section 63112)	NA		M 24, NBOL M 24, NBIL M 24, SBOL M 24, SEIL	BC BC BC BC	0.33 0.36 0.31 0.34
M 24 at Drahnor Rd. (Oakland County) (Control Section 63112)	NA		M 24, NBOL M 24, NBIL M 24, SBOL M 24, SEIL	CONC CONC BC BC	0.32 0.38 0.38 0.38
M 150 (Rochester Rd) at Fourth in Rochester (Control Section 63132)	20		M 150, NBOL M 150, NBIL M 150, SBOL M 150, SEIL	BC BC BC BC	0.37 0.39 0.38 0.41
M 150 (Rochester Rd) at University in Rochester (Control Section 63132)	31		M 150, NBOL M 150, NBIL M 150, SBOL M 150, SEIL	BC BC BC BC	0.38 0.37 0.37 0.40
US 10BR (S. Saginaw) at South Blvd in Pontiac (Control Section 63151)	65		US 10BR, NBRT US 10BR, NE#3 US 10BR, NE#2 US 10BR, NEIL US 10BR, SEOL US 10BR, SECL US 10BR, SEIL	BA BA BA BA BA BA BA	0.36 0.35 0.40 0.38 0.33 0.35 0.37
US 10BR (S. Saginaw) at Wilson in Pontiac (Control Section 63151)	53		US 10BR, NBOL US 10BR, NBCL US 10BR, NEIL US 10BR, SEOL US 10BR, SECL US 10BR, SEIL	BA BA BA BA BA BA	0.36 0.36 0.35 ---(1.2) 0.35 0.36
US 10BR (S. Saginaw) at Rapid in Pontiac (Control Section 63151)	28		US 10BR, NBOL US 10BR, NBCL US 10BR, NEIL US 10BR, SEOL US 10BR, SECL US 10BR, SEIL	BA BA BA BA BA BA	---(1.2) 0.37 0.36 ---(1.2) 0.37 0.35

DISTRICT 9 (CONT)

(1.2) Not tested because of parked cars.

TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1987 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
DISTRICT 9 (CONT.)					
Oakland County Cont.					
I 75 from South Blvd. in M 59 (Control Section 63174)	NA		I 75, NBOL I 75, NBCL I 75, NBIL	CONC CONC CONC	0.44 0.51 0.51
US 10BR (Wide Track) at Orchard Lake in Pontiac (Control Section 63201)	32		US 10BR, SBOL US 10BR, SB#4 US 10BR, SB#3 US 10BR, SB#2 US 10BR, SBTL	CONC CONC CONC CONC CONC	0.37 0.37 0.37 0.43 0.40
US 10BR (Wide Track) at M 59 (W. Huron) in Pontiac (Control Section 63201)	56		US 10BR, SBOL US 10BR, SBCL US 10BR, SBIL M 59, EBOL M 59, EBIL M 59, WBOL M 59, WBIL	CONC CONC CONC CONC CONC CONC CONC	0.32 0.34 0.36 0.33 0.33 0.36 0.34
St. Clair County					
M 21 (Oak) at 10th in Port Huron (Control Section 77023)	20		M 21, EBOL M 21, EBCL M 21, EBIL	CONC CONC CONC	0.47 0.43 0.37
US 25BR at Water in Port Huron (Control Section 77032)	21		US 25BR, NBOL US 25BR, NBIL US 25BR, SBOL US 25BR, SBIL	EC EC EC EC	0.27 0.25 0.26 0.28
US 25BR (Pine Ave) at McMorran in Port Huron (Control Section 77032)	32		US 25BR, NBOL US 25BR, NBIL US 25BR, SBOL US 25BR, SBIL	EC EC EC EC	0.27 0.30 0.28 0.28
US 25BR (Pine Grove) at Stone in Port Huron (Control Section 77032)	25		US 25BR, NBOL US 25BR, NBIL US 25BR, SBOL US 25BR, SBIL	EC EC EC EC	0.37 0.40 0.35 0.39
US 25BR (Pine Grove) at 10th in Port Huron (Control Section 77081)	42		US 25BR, NBOL US 25BR, NBIL US 25BR, SBOL US 25BR, SBIL	EC EC EC EC	0.38 0.38 0.37 0.39
I 94 (14th St) at Hancock in Port Huron (Control Section 77111)	22		I 94, EBOL I 94, EBIL I 94, WBOL I 94, WBIL	CONC CONC CONC CONC	0.43 0.46 0.35 0.42
DISTRICT 10					
Monroe County					
US 24 (Telegraph) @ DuBar Rd, Monroe Co. (Control Section 58052)	NA		US 24, NBOL US 24, NBIL US 24, SBOL US 24, SBIL	EC EC EC EC	0.24 0.21 0.21 0.24
DISTRICT 10 (CONT.)					
Monroe County Cont.					
US 24 (Telegraph) @ Stewart Rd, Monroe Co. (Control Section 58052)	NA		US 24, NBOL US 24, NBIL US 24, SBOL US 24, SBIL	SA SA SA SA	0.43 0.45 0.43 0.43
US 24 (Telegraph) @ US 25 (Monroe) (all legs) (Control Sections 58052 and 58071)	NA		US 24, NBOL US 24, NBIL US 25, NBOL US 25, NBIL US 24 - US 25, SBOL US 24 - US 25, SBIL	SA SA SA SA SA SA	0.43 0.44 0.42 0.46 0.41 0.37
US 25 @ DuBar Rd, Monroe Co. (Control Section 58071)	NA		US 25, NB US 25, SB	EC EC	0.24 0.22
US 25 from Elm St to Willow St, City of Monroe (Control Section 58071)	NA		US 25, NBOL US 25, NBIL US 25, SBOL US 25, SBIL	EC EC EC EC	0.20 0.20 0.22 0.23
US 25 @ Noble St, City of Monroe (Control Section 58071)	NA		US 25, NBOL US 25, NBIL US 25, SBOL US 25, SBIL	EC EC EC EC	0.19 0.20 0.17 0.20
Wayne County					
I 94 at entrance ramp from US 12 (Michigan) (Control Section 82022)	74		I 94, EBOL I 94, EBOL I 94, EBCL I 94, EBCL I 94, EBIL I 94, EBIL I 94, WBOL I 94, WBCL I 94, WBIL	EC CONC EC CONC EC CONC EC EC EC	0.43 0.39 0.47 0.37 0.51 0.40 0.37 0.47 0.53
US 24 (Telegraph) at Eureka in Taylor Twp. (Control Section 82052)	50		US 24, NBOL US 24, NBOL US 24, NBCL US 24, NBCL US 24, NEIL US 24, NEIL US 24, NEIL US 24, NEIL US 24, NEIL US 24, NEIL US 24, SBOL US 24, SBOL US 24, SBIL	EC CONC EC CONC EC CONC EC CONC CONC CONC CONC CONC CONC CONC	0.36 0.35 0.38 0.38 0.37 0.37 0.38 0.41 0.33 0.33 0.32
US 24 (Telegraph) at Northline in Taylor Twp. (Control Section 82052)	27		US 24, NBOL US 24, NBOL US 24, NEIL US 24, SBOL US 24, SBOL US 24, SBIL	BA BA BA CONC CONC CONC	0.34 0.41 0.41 0.33 0.33 0.33

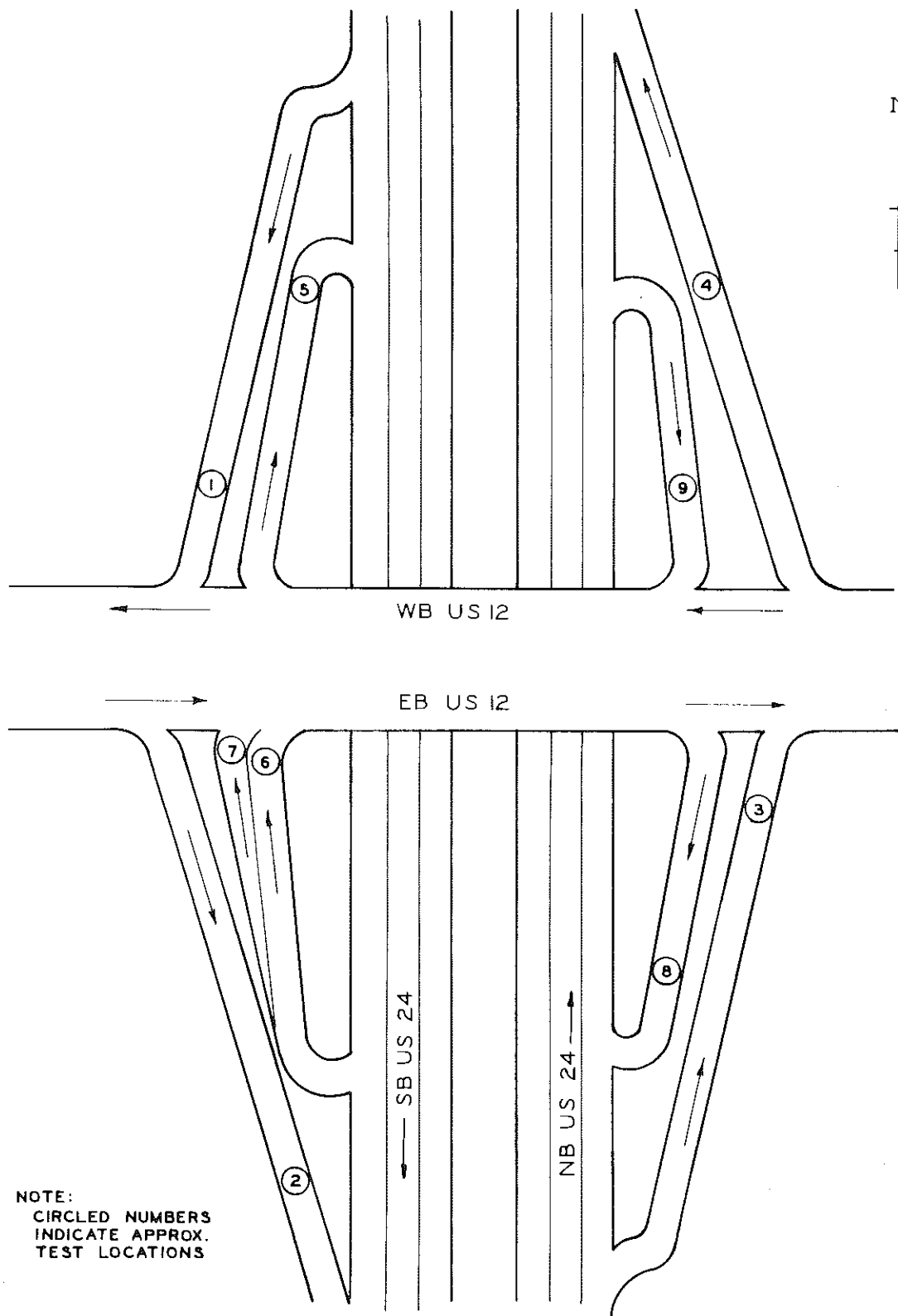
TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1967 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
Wayne County Cont.					
US 24 (Telegraph) @ Carlyle Rd, City of Dearborn (Control Section 82052)	NA		US 24, NBOL US 24, NB#3 US 24, NB#2 US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	BA BA BA BA CONC CONC CONC	0.35 0.36 0.37 0.38 0.35 0.34 0.35
US 24 (Telegraph) at Goddard in Taylor Twp. (Control Section 82052)	33		US 24, NBOL US 24, NBCL US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	BA BA BA CONC CONC CONC	0.33 0.40 0.40 0.36 0.37 0.34
US 24 (Telegraph) at Wick Rd in Taylor Twp. (Control Section 82052)	32		US 24, NBOL US 24, NBCL US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	BA BA BA CONC CONC CONC	0.36 0.39 0.38 0.35 0.36 0.34
US 24 (Telegraph) at Campaign in Taylor Twp. (Control Section 82052)	24		US 24, NBOL US 24, NB#3 US 24, NB#2 US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	BC BC BC BC CONC CONC CONC	0.41 0.39 0.44 0.47 0.32 0.33 0.33
US 24 (Telegraph) at Van Born in Taylor Twp. (Control Section 82052)	33		US 24, NBOL US 24, NB#3 US 24, NB#2 US 24, NBIL US 24, SBOL US 24, SB#3 US 24, SB#2 US 24, SBIL	CONC CONC CONC CONC SA SA SA	0.35 0.33 0.35 0.35 0.45 0.46 0.47
US 24 (Telegraph), all ramps, at US 12 (Michigan) in Dearborn (Control Section 82053)	102		US 24 and US 12 ramps ^(1a) SB (1) SB (2) SB (3) NB (4) NB (5) NBOL (6) NBIL (7) SB (8) SB (9)	BA BA BA BA BA BA BA BA BA	0.39 0.39 0.38 0.39 0.39 0.39 0.42 0.42 0.42
US 24 (Telegraph) at George in Dearborn Heights (Control Section 82053)	22		US 24, NBOL US 24, NB#3 US 24, NB#2 US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	BA BA BA BA CONC CONC CONC	0.37 0.37 0.41 0.39 0.34 0.37 0.35

DISTRICT 10 (CONT.)

Location	1967 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
Wayne County Cont.					
US 24 (Telegraph) at Ann Arbor Trail in Dearborn Heights (Control Section 82053)	40		US 24, NBOL US 24, NBCL US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	CONC CONC CONC CONC CONC CONC	0.35 0.36 0.36 0.33 0.35 0.33
US 24 (Telegraph) NB at Fordson and SR at Dearwood in Dearborn Heights (Control Section 82053)	29		US 24, NBOL US 24, NB#3 US 24, NB#2 US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	BA BA BA BA CONC CONC CONC	0.36 0.39 0.43 0.45 0.38 0.37 0.39
US 24 (Telegraph) at Schoolcraft in Redford Twp. (Control Section 82053)	73		US 24, NBOL US 24, NBCL US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL Schoolcraft, EBOL Schoolcraft, EB#3 Schoolcraft, EB#2 Schoolcraft, EBIL Schoolcraft, WBOL Schoolcraft, WB#3 Schoolcraft, WB#2 Schoolcraft, WBIL	SA SA SA SA SA SA SA SA SA SA SA SA SA SA	0.40 0.43 0.42 0.39 0.41 0.43 0.41 0.43 0.43 0.49 0.40 0.41 0.42 0.47
US 24 (Telegraph) at Aracia in Redford Twp. (Control Section 82053)	21		US 24, NBOL US 24, NBCL US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	CONC CONC CONC CONC CONC CONC	0.38 0.40 0.37 0.33 0.35 0.36
US 24 (Telegraph) @ Cherry Hill Rd, City of Dearborn (Control Section 82053)	NA		US 24, NBOL US 24, NB#3 US 24, NB#2 US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	BC BC BC BC CONC CONC CONC	0.38 0.37 0.39 0.39 0.33 0.35 0.34
US 24 (Telegraph) @ Wilson Rd, City of Dearborn (Control Section 82053)	NA		US 24, NBOL US 24, NB#3 US 24, NB#2 US 24, NBIL US 24, SBOL US 24, SBCL US 24, SBIL	BA BA BA BA CONC CONC CONC	0.29 0.29 0.38 0.36 0.35 0.34 0.37

(1a) See Schematic 3.



Schematic 3. High-accident test location showing US 24 (Telegraph) at US 12 (Michigan), all ramps. (Control Section 82053).

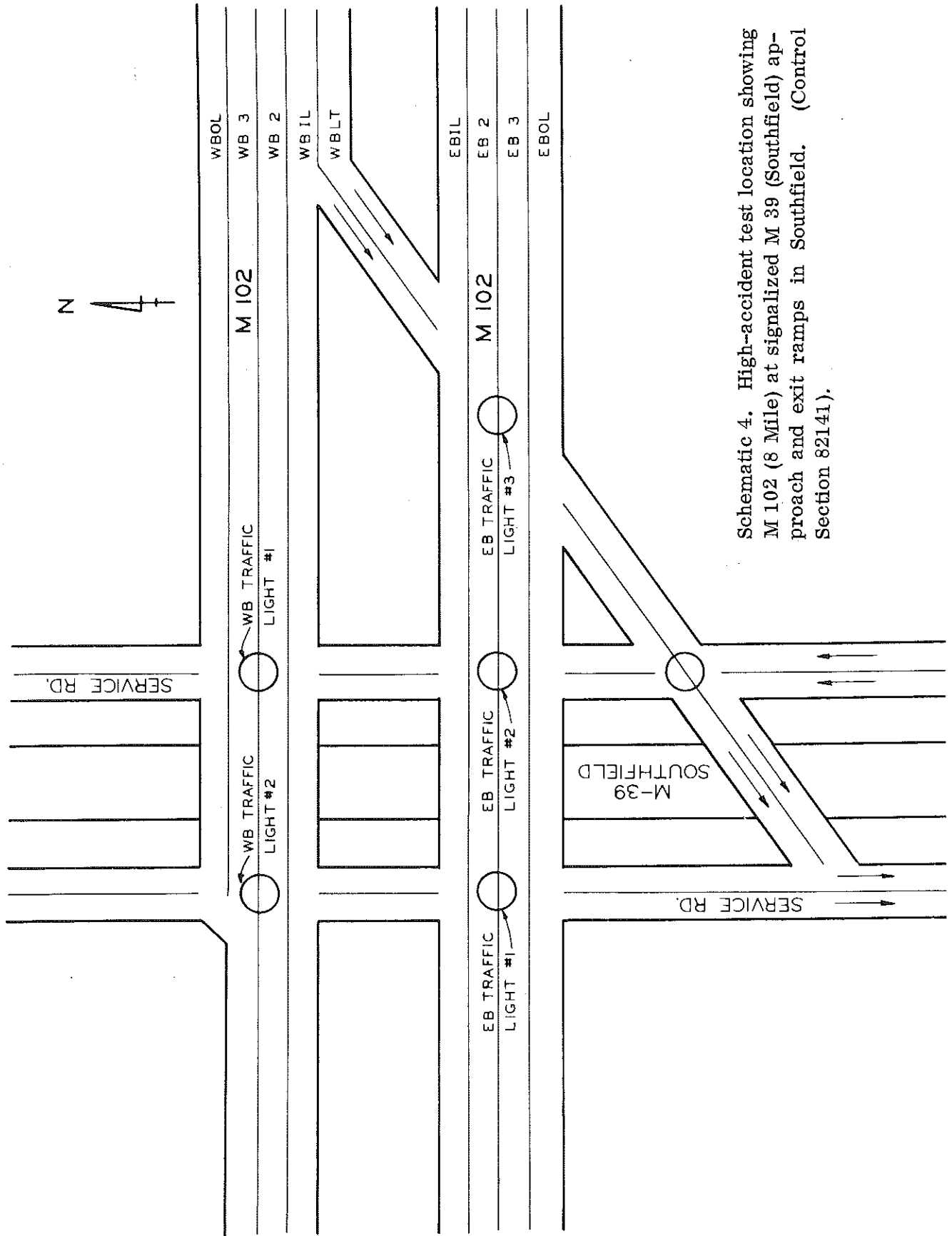
TABLE 23 (Cont.)
HIGH-ACCIDENT LOCATIONS FOR DISTRICTS 1 THROUGH 10

Location	1967 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
Wayne County Cont.					
US 24 (Telegraph at Fensell in Redford Twp. (Control Section 82053))	39		US 24, NBOL US 24, NBCL US 24, EBIL US 24, SBOL US 24, SBCL US 24, SBIL Fensell, EBOL Fensell, EBIL Fensell, WBOL Fensell, WBIL	SA SA SA SA SA SA SA SA SA SA	0.38 0.40 0.41 0.39 0.42 0.40 0.38 0.40 0.40 0.44
US 12 (Michigan) from Henry Ruff to Middle Belt in Inkster (Control Section 82061)			US 12, EBOL US 12, EBCL US 12, EBIL US 12, WBOL US 12, WBCL US 12, WBIL US 12, WBOL US 12, WBOL US 12, WBCL US 12, WBIL	BA BA BA BA BA BA SA SA SA SA	0.45 0.40 0.38 0.41 0.40 0.38 0.51 0.52
US 12 (Michigan) at Middle-belt Rd in Inkster (Control Section 82061)			US 12, EBOL US 12, EBIL US 12, WBOL US 12, WBCL US 12, WBIL	BA BA BA BA BA	0.37 0.36 0.35 0.37 0.33
US 12 (Michigan) at Inkster in Inkster (Control Section 82061)	34		US 12, EBOL US 12, EB#3 US 12, EB#2 US 12, EBIL US 12, WBOL US 12, WBCL US 12, WBIL	BA BA BA BA BA BA BA	0.38 0.35 0.36 0.41 0.38 0.36 0.39
US 12 (Michigan) at John Daly in Inkster (Control Section 82061)	25		US 12, EBOL US 12, EBCL US 12, EBIL US 12, WBOL US 12, WBIL	BA BA BA BA BA	0.38 0.34 0.33 0.35 0.36
US 12 (Michigan) at Beech-Daly in Dearborn Heights (Control Section 82061)	42		US 12, EBOL US 12, EBCL US 12, EBIL US 12, WBOL US 12, WBIL	BA BA BA BC BC	0.40 0.41 0.41 0.43 0.43
US 12 (Michigan) at Outer Drive in Dearborn (Control Section 82062)	58		US 12, EBOL US 12, EB#3 US 12, EB#2 US 12, EBIL US 12, WBOL US 12, WB#3 US 12, WB#2 US 12, WBIL	BC BC BC BC CONC CONC CONC CONC	0.42 0.46 0.46 0.46 0.34 0.32 0.33 0.33

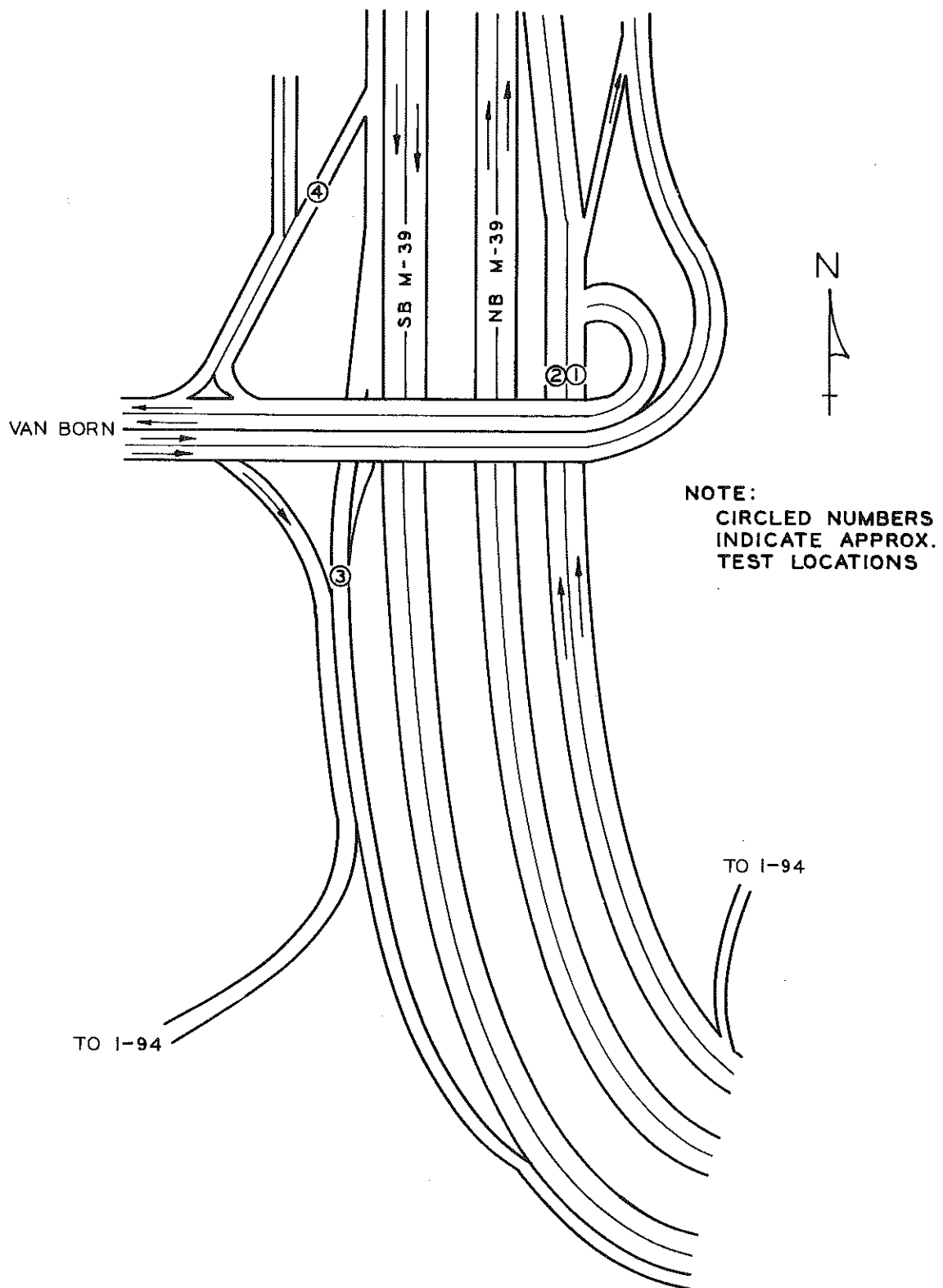
DISTRICT 10 (CONT)

Location	1967 Accidents		Test Location	Surface Type	Average Coefficient
	Wet Surface	Total			
Wayne County Cont.					
US 12 (Michigan) at Oakman in Dearborn (Control Section 82062)	63		US 12, EBOL US 12, EBCL US 12, EBIL US 12, WBOL US 12, WBCL US 12, WBIL	BA BA BA BA BA BA	0.39 0.37 0.38 0.38 0.36 0.36
US 12 (Michigan) @ Military St, City of Dearborn (Control Section 82062)	NA		US 12, EBOL US 12, EBIL US 12, WBOL US 12, WBIL	BA BA BA BA	0.36 0.35 0.41 0.37
US 12 (Michigan) @ Wyoming Ave, Cities of Detroit & Dearborn (Control Section 82062)	NA		US 12, EBOL US 12, EBCL US 12, EBIL US 12, WBOL US 12, WBIL M 153, SBOL M 153, SBIL	BA BA BA BA BA BA BA	0.36 0.36 0.36 0.35 0.42 0.39
US 25 (Oak) at M 39 (South-field) in Lincoln Park (all approaches) (Control Section 82071)	56		M 39, EBOL M 39, EB#3 M 39, EB#2 M 39, EBIL M 39, WBOL M 39, WB#3 M 39, WB#2 M 39, WBIL US 25, NBOL US 25, NBCL US 25, NBIL US 25, SBOL US 25, SBCL US 25, SBIL	BA BA BA BA BA BA BA BA BA BA BA BA BA BA	0.34 0.37 0.38 0.38 0.41 0.37 0.40 0.40 0.35 0.35 0.36 0.36 0.36 0.36
M 153 (Ford) at Merriman in Garden City (Control Section 82081)	43		M 153, EBOL M 153, EBIL M 153, WBOL M 153, WBIL	BA BA CONC BA	0.33 0.35 0.41 0.36
M 153 (Ford Rd) @ Wayne Rd, City of Westland (Control Section 82081)	NA		M 153, EBOL M 153, EBIL M 153, WBOL M 153, WBIL	BA BA BA BA	0.37 0.37 0.33 0.35
M 153 (Ford Rd) @ Kinloch St, City of Dearborn Heights (Control Section 82081)	NA		M 153, EBOL M 153, EBIL M 153, WBOL M 153, WBIL	BA BA BA BA	0.37 0.41 0.39 0.41
M 153 (Ford) at Inkster in Dearborn Heights (Control Section 82081)	44		M 153, EBOL M 153, EBIL M 153, WBOL M 153, WBIL	CONC BC BC BC	0.36 0.38 0.38 0.37
M 14 (Plymouth) @ M 14 (Ann Arbor Rd), City of Livonia (Control Section 82101)	NA		M 14, EBOL M 14, EBIL M 14, WBOL M 14, WBIL	SA SA SA SA	0.36 0.41 0.42 0.35

DISTRICT 10 (CONT)



Schematic 4. High-accident test location showing M 102 (8 Mile) at signalized M 39 (Southfield) approach and exit ramps in Southfield. (Control Section 82141).



Schematic 5. High-accident test location showing M 39 (Southfield) at VanBorn (approaches and exit ramps plus service drive) in Allen Park. (Control Section 82192).

SECTION V
SPECIAL REQUEST TESTS

Table 24 -- Special Requests

During the course of the year, requests for skid tests are received from field personnel or through the Design, Maintenance, Traffic, or Testing and Research Divisions. These requests receive priority considerations during scheduling of skid tests, and friction levels are forwarded to the person or agency initiating the request as soon as possible after completion of field measurements. Table 24 contains skid test data resulting from the special requests received during 1968.

TABLE 24
SPECIAL REQUESTS

Special Request No. *	Project or Control Section No.	Location	Surface Type	Route	Direction and Lane	Average Coefficient of Wet Sliding Friction
1	82091C, C5	Schaefer Rd. (formerly M 39) between Mellon Rd. and Gate No. 4 at the Ford Motor Co.	BC	(formerly M 39)	NBOL	----
					NBCL	0.50
					NBIL	0.52
					SBOL	0.43
					SBCL	0.47
SBIL	0.53					
2	Control Section 11013	BL 94 (Main St.) at Riverview in Benton Harbor	CONC	BL 94	EBOL	0.38
					EBIL	0.35
					WBOL	0.34
					WBIL	0.38
2	Control Section 11013	BL 94 (Main St.) at Sixth St. in Benton Harbor	CONC	BL 94	EBOL	0.35
					EBIL	0.32
					WBOL	0.32
					WBIL	0.34
2	11-85, C1	BL 94 (Main St.) from M 139 (Fair St.) to M 139 (Paw-Paw) in Benton Harbor	BRICK	BL 94	EBOL	0.29
					EBIL	0.29
					WBOL	0.28
					WBIL	0.32
3	82053-044	Northbound US 24 (Telegraph) from Joy Rd. to W. Chicago	NSST	US 24	NBOL	0.59
					NB#3	0.60
					NB#2	0.61
					NBIL	0.61
4	33033-004	US 27 (Larch St.) from Shiawassee Ave. to NYCRR tracks, South of Saginaw St. City of Lansing	Slurry Seal	US 27	NBOL	0.54
					NBCL	0.63
					NBIL	0.60
4A	Control Section 09033	US 23 at Linwood Rd.	NSST	US 23	NBOL	0.49 ⁽¹⁾
					NBIL	0.56 ⁽¹⁾
					SBOL	0.49 ⁽¹⁾
					SBIL	0.60 ⁽¹⁾
					NBOL	0.51 ⁽²⁾
					NBIL	0.59 ⁽²⁾
					SBOL	0.54 ⁽²⁾
					SBIL	0.63 ⁽²⁾
4A	Control Section 09033	US 23 at Grove St.	NSST	US 23	NBOL	0.53 ⁽¹⁾
					NBIL	0.62 ⁽¹⁾
					NBOL	0.55 ⁽²⁾
					NBIL	0.62 ⁽²⁾
4A	Control Section 09042	M 25 at Wagner Rd.	NSST	M 25	EB	0.52 ⁽¹⁾
					WB	0.48 ⁽¹⁾
					EB	0.54 ⁽²⁾
					WB	0.55 ⁽²⁾
5	47064, C2	I 96 from US 23 E to the Livingston-Oakland County Line	CONC	I 96	EBOL	0.43
					EBCL	0.50
					WBOL	0.38
					WBCL	0.44
5	47064A, C20	I 96 from US 23 SE to the Oakland-Livingston Co. Line	CONC	I 96	EBIL	0.51
					WBIL	0.43
5	63022, C1	I 96 from the Oakland-Livingston County Line E to the Huron River Bridge	CONC	I 96	EBOL	0.39
					EBCL	0.56
					WBOL	0.37
					WBCL	0.41

(1) Tests conducted in July 1968.

(2) Tests conducted in October 1968.

TABLE 24 (Cont.)
SPECIAL REQUESTS

Special Request No. *	Project or Control Section No.	Location	Surface Type	Route	Direction and Lane	Average Coefficient of Wet Sliding Friction
5	63022-021	I 96 from the Livingston-Oakland County Line E 1.70 miles	CONC	I 96	EBIL WBIL	0.54 0.56
5	63-29, C9	I 96 from the Huron River Bridge E to Beck Rd.	CONC	I 96	EBOL EBCL WBOL WBCL	0.36 0.41 0.33 0.38
5	63022A, C10	I 96 from approximately 0.85 mile E of Kent Lake Rd. SE to Beck Rd.	CONC	I 96	EBIL WBIL	0.47 0.40
5	63-29, C10	I 96 from Beck Rd. E to Ten Mile Rd.	CONC	I 96	EBOL EBCL WBOL WBCL	0.33 0.39 0.36 0.39
5	63022A, C9	I 96 from Beck Rd. E to Ten Mile Rd.	CONC	I 96	EBIL WBIL	0.43 0.40
5	63-101, C1	I 96 from Ten Mile Rd. to Haggarty Rd.	CONC	I 96	EBOL EBIL WBOL WBIL	0.38 0.51 0.37 0.43
5	63-29, C10	I 96 from Haggarty Rd. E to a point W of I 96BL (to Farmington)	CONC	I 96	EBOL EBIL WBOL WBIL	0.41 0.54 0.37 0.46
5	63-29, C11	I 96 from a point W of I 96BL (to Farmington) E to W of Middlebelt Rd.	CONC	I 96	EBOL EBIL WBOL WBIL	0.39 0.55 0.41 0.52
5	63-29, C12	I 96 from W of Middlebelt Rd. E to E of I 96BL (from Farmington)	CONC	I 96	EBOL EBIL WBOL WBIL	0.45 0.57 0.40 0.51
6	38061-008	M 60 from Spring St., in Concord, West to Homer Rd.	Asphalt Cement	M 60	EB WB	0.58 0.50
6	38061-008	M 60 from Homer Rd. West to the Jackson-Calhoun County Line	Asphalt Emulsion	M 60	EB WB	0.57 0.56
6	38061-008	M 50 from Stoney Lake Rd. N and W to S City Limits of Jackson	Asphalt Emulsion	M 50	EB WB	0.53 0.50
7	Mm 90-74062-01, C3	M 46 from W City Limits of Carsonville West 3 miles	Single Seal	M 46	EB WB	0.41 0.43
8	22012-002	On M 95 at the US 2 junction	BA	M 95	NB SB NB SB	0.28 ⁽³⁾ 0.23 ⁽³⁾ 0.35 ⁽⁴⁾ 0.33 ⁽⁴⁾
9	11015, C1 11015B, C36	I 94 at the 2 ⁰ 30' curve adjacent to Mile Post 22, South of St. Joseph	CONC	I 94	EBOL EBCL EBIL WBOL WBCL WBIL	0.49 0.57 0.65 0.52 0.61 0.65

(3) Tests conducted in August 1968.

(4) Tests conducted in October 1968.

TABLE 24 (Cont.)
SPECIAL REQUESTS

Special Request No. *	Project or Control Section No.	Location	Surface Type	Route	Direction and Lane	Average Coefficient of Wet Sliding Friction
--	81031-005	US 12BR from the W Jct of M 17 E to the E Limits of Ypsilanti	BC	US 12BR	EBOL EBIL WBOL WBIL	0.46 0.49 0.46 0.49
--	21024-008	US 2 from 0.2 mile E of US 41 Jct E to Jct with Co. Rd. J-1 in Ensign	SA NSST	US 2	EB WB EB WB	0.60 0.61 0.21 0.23
--	18022-006	US 10 from the West City Limits of Farwell to M 115 intersection	BA	US 10	EB WB	0.26 0.26
--	18022-006	M 61, 2 miles W of the Clare-Gladwin Co. Line and M 61 from 3 miles E of M 30 E a distance of 7 miles	BA	M 61	EB WB	0.45 0.49
--	20032-004	I 75BL - M 93 from 167' N of M 72, in Grayling, N 2.54 miles	BA	I 75BL - M 93	NB SB	0.35 0.30
--	20032-004	M 93 from 2.95 miles S of Co. Rd. 612 N to Co. Rd. 612	BA	M 93	NB SB	0.48 0.43
--	24051-002	M 131 from 500' N of US 31 N and W to Zell St. in Harbor Springs	BA	M 131	NB SB	0.32 0.27
--	48041-002	M 28 from the Schoolcraft-Luce Co. Line E to M 123, S of Newberry	BA	M 28	EB WB	0.35 0.34
--	83021-008	M 55 from 180' W of County Rd. 21 to M 115	BA	M 55	EB WB EB WB	0.30 ^(e) 0.30 ^(e) 0.38 ^(e) 0.44 ^(e)
--	49023-009	US 2 from 500' W of County Rd 402 E to 500' W of I 75	SA	US 2	EB WB	0.32 0.33
--	49023-009	I 75BL from Burdette St. N to Marquette St. in the City of St. Ignace	SA	I 75 BL	NBOL NBIL SBOL SBIL	0.40 0.41 0.41 0.46

(^e) Eastern 1.5 miles of project.

(^a) Remainder of project.