

OFFICE MEMORANDUM



MICHIGAN
STATE HIGHWAY DEPARTMENT

June 1, 1965

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To: W. W. McLaughlin
Testing & Research Engineer

From: E. A. Finney

Subject: Skidproofing Treatments at South Cedar Street (US 127) Intersections with Holmes Rd. and Baker St. in Lansing. Research Project 54 G-74. Research Report No. R-521.

This report results from H. J. Rathfoot's having recently called our attention to the removal of relatively new skidproofing treatment by traffic at certain intersections on Cedar St. in Lansing.

At the request of H. H. Cooper, skid resistance tests were performed June 22, 1964, at these same intersections, with results indicating slippery conditions at both locations (Table 1). The wet sliding coefficient of friction (40 mph) at Cedar and Holmes averaged 0.21 on a polished bituminous concrete surface, while at Cedar and Baker it was only slightly better at 0.30 on a worn concrete surface. All tests were run on Cedar St. in stopping areas approaching the lights.

Both locations were given corrective treatments under Project Mob 33032C, C6, consisting of a 70 lb per sq yd asphalt emulsion hot mix, using 31A gravel and 2NS sand at Baker St. and 50 lb per sq yd 2NS sand-asphalt emulsion hot mix at Holmes Rd. Both surfacings were completed on October 26, 1964. Both mixes used asphalt emulsion in place of asphalt cement in order to evaluate performance in a hot mix for the city of Lansing. Skid tests performed after the treatments indicated improved coefficients of 0.47 for the Holmes Rd. location and 0.52 for the Baker St. location.

Upon receiving word of Mr. Rathfoot's observations, the Laboratory's Concrete and Bituminous Unit inspected the intersections on April 27, 1965 and arranged for skid testing on May 25. This evaluation of durability of these treatments after one winter of exposure produced the following observations:

South Cedar Street (US 127) at Holmes Rd. The 2NS sand-asphalt emulsion hot mix was applied over a polished and rutted bituminous pavement containing limestone aggregate. As can be seen in Fig. 1, fairly large areas of the treatment have failed. About 30 percent of the treatment within the intersection proper has been removed by traffic. The stopping areas approaching the intersection, however, seem at this time to be relatively unaffected by traffic. Skidometer data obtained in the stopping areas on May 25, 1965, indicate the surface friction properties have decreased slightly since the tests last November.

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South Cedar (US 127) at Baker St. The 31A bituminous concrete-emulsified asphalt hot mix was applied over a polished concrete surface containing gravel aggregate. Fig. 2 indicates that the same problem encountered at Holmes Rd. was found here, although not to as great a degree. Possibly 5 to 10 percent of the treatment has been removed within the boundaries of the intersection. The stopping lanes are in excellent condition, although skid resistance has dropped 0.12 from 0.52 in November 1964, to 0.40 when tested in April 1965. Some cracking and spalling can be found at most joints and around manholes, but this is probably due to movement of the underlying concrete.

OFFICE OF TESTING AND RESEARCH



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TABLE 1
 ASPHALT EMULSION HOT MIX SURFACE COURSES
 AT CEDAR STREET (US 127) INTERSECTIONS

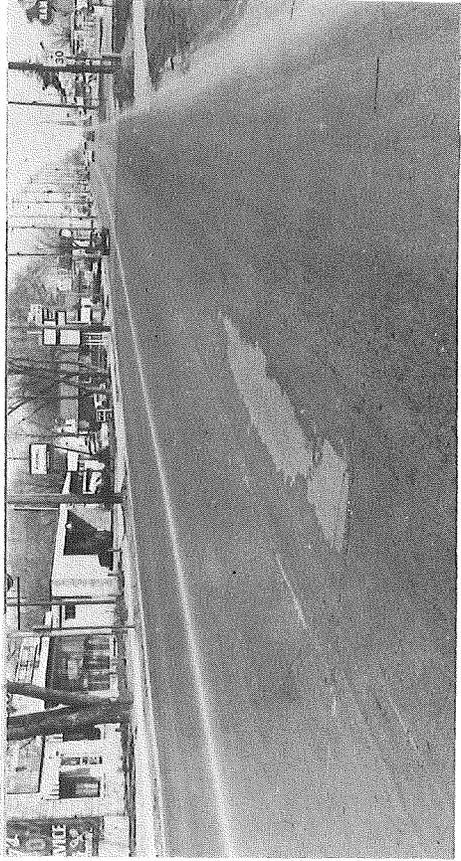
Intersection	Surface Course	Direction and Lane	Wet Sliding Coefficients, 40 mph		
			Before Resurfacing (6-22-64)	After Resurfacing	
				(11-1-64)	(5-25-65)
Holmes Rd.	2NS sand-emulsified asphalt hot mix (50 lb/sq yd)	SBOL	0.23	0.45	0.40
		SBIL	0.22	0.47	0.40
		NBIL	0.20	0.47	0.41
		NBOL	0.19	0.49	0.42
		Avg.	0.21	0.47	0.41
Baker St.	Bituminous concrete- emulsified asphalt hot mix (70 lb/sq yd)	SBOL	0.33	0.47	0.39
		SBIL	0.32	0.55	0.39
		NBIL	0.31	0.56	0.43
		NBOL	0.24	0.48	0.38
		Avg.	0.30	0.52	0.40



Looking northeast



Looking southeast



Northbound lanes north of intersection

Figure 1. Holmes Rd. intersection with Cedar St., showing rough appearance and areas where surface treatment is missing.



Looking south



Looking north across intersection



Manholes in intersection



Southbound centerline at south end of treatment

Figure 2. Baker St. intersection with Cedar St. showing damaged areas in surface treatment.