

OFFICE MEMORANDUM



MICHIGAN
DEPARTMENT OF STATE HIGHWAYS

May 1, 1968

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To: R. L. Greenman
Testing and Research Engineer

From: L. T. Oehler

Subject: Final Report on Test Applications of 3-M's "Green-Lite or Liquid Instant Set" Paint Striping. Research Project 65 NM-138(1). Research Report No. R-672.

Subject "Green-Lite" paint striping is 3-M's latest development, a liquefied version of the original powder-form "Instant Set." The Instant Set was tested by the Department in 1965 as specialty striping, i. e., for crosswalks, etc., as presented in Research Laboratory Report Nos. R-532 and R-576. On the basis of the tests, which showed the Instant Set almost as durable as standard paint, the Department subsequently acquired several of the hand-operated machines to apply the powdered striping in specialty locations where its almost instantaneous drying greatly facilitated application.

The 1967 tests covering the liquid Green-Lite were authorized by the Maintenance Division in memoranda from J. F. Oravec of March 2, 1967 and from J. P. Woodford of April 27, 1967. The tests consisted of the following with all striping applied by 3-M equipment except for the comparison MDSH longitudinal paint stripes:

1. Lansing area application on May 15-16, 1967 on four lane M 43, West of Waverly Road.

(a) Longitudinal lane skip-striping applied on black-top of the WB lane and on concrete of the EB lane. Alternate 20 ft lengths were standard MDSH paint applied on same date for comparison purposes. Roadway for the test was about 1 mile long.

(b) Transverse lines applied across both concrete and bituminous lanes on EB M 43 consisted of four different formulas of Green-Lite, plus MDSH paint and 3-M paint.

2. Detroit area application on May 17, 1967 as longitudinal striping on SB US 24, N. of Warren Ave, mostly on concrete.

3. Since Green-Lite striping outlined in 1 (a) and (b) above, performed poorly, it was re-applied on an adjoining section of M 43 on August 2, 1967.

Test Results

The following comments on the performance of the tested striping are numbered to correspond with the above designations:

1. (a) Longitudinal Striping. Initially the Green-Lite striping was apt to have higher night visibility than the control paint, though this was variable. At the 4-month level the durability of the Green-Lite was rated 20 percent poorer on black-top and 50 percent poorer on concrete than the comparison MDSH paint.

(b) Transverse Striping. The four different formulas of Green-Lite began to show almost immediate deterioration. This progressed to almost complete failure within a month on concrete, though better performing on black-top as shown in Figure 1. At the same time the two comparison paint stripes showed good performance.
2. The longitudinal striping on concrete in Detroit has shown better performance than above striping, though it showed flaking deterioration after 5-months exposure, Figure 2. Then, the durability was poorer than the comparison Department paint striping.
3. Re-test of Lansing area striping. Initially the Green-Lite striping performed on a par with the comparison MDSH paint striping and in that respect was better than the original application. However, deterioration of the Green-Lite formulas began after 2-months of exposure in both the longitudinal and transverse tests and progressed rapidly to show almost complete loss of striping on concrete after 5-months. The condition of the transverse striping is shown in Figure 3.

Recommendation:

In view of the varied, but consistently poorer than standard-paint performance of the fast drying (less than 10 seconds) Green-Lite striping in three test applications, we recommend that evaluation of the current development be terminated. Contributing reasons are that the Green-Lite requires special application equipment and costs about \$8.00 per gallon. However, the initiating Division may have a modifying appraisal, when considering factors other than the reported performance.

TESTING AND RESEARCH DIVISION



L. T. Oehler, Director
Research Laboratory Section

LTO/AJP:sjt

Attachment

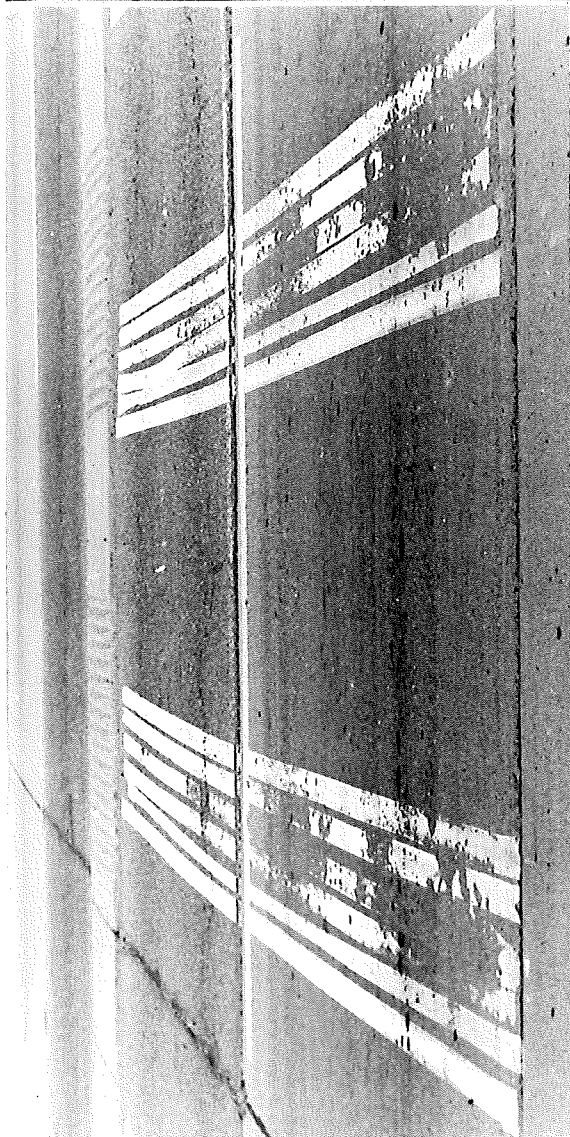


Figure 1 (above). Transverse beaded test stripes on M 43 concrete (foreground) and black-top (background) after only one month of service. The 4 deteriorated stripes on the right in each group are Green-Lite formulas; the 2 on the left are MDSH and 3-M paint, respectively.



Figure 2 (above). Green-Lite lane striping (left) shows flaking after 5 months exposure on US 24 in Detroit. MDSH standard striping on right.

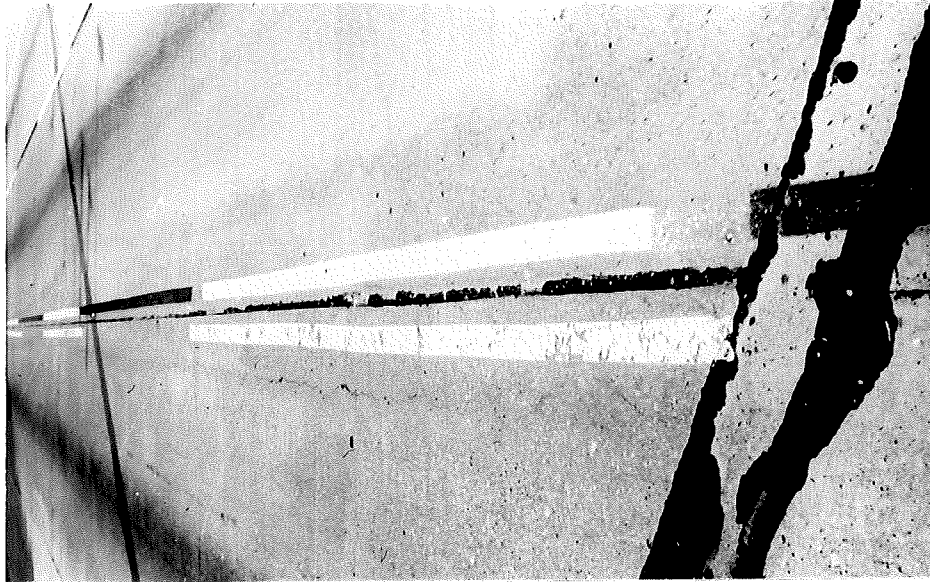


Figure 3 (left). Five groups of transverse stripes after 5 months exposure on M 43. Concrete lane at left, black-top at right. First 2 stripes in each group are 3-M and MDSH paint, respectively. The remainder are Green-Lite formulas showing almost complete loss on the concrete lane.