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1952 PERFORMANCE TESTS OF TRAFFIC PAINTS

By

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Joint investigation between Maintenance, Planning and Traffic,
and Testing and Research Divisions

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Interim Report

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1952 PERFORMANCE TESTS OF TRAFFIC PAINTS

In Mr. McMonagle's letter of April 1, 1952, addressed to Mr. Downey, it was requested that the possibility of purchasing traffic paints on the basis of performance be investigated. It was also suggested that a comparison be made of present Department specification paint with two proprietary products, 3M Centerlite and Prismo Premix. The Research Laboratory was given the assignment of coordinating the work and reporting the results. This program was initiated and the first stripes put down on June 23 of this year. In order to make the investigation more productive and to obtain as much information as possible, the program was expanded to include seven different paints in both longitudinal and transverse stripes, and two types of beaded line - one with 4 pounds of Type II beads per gallon of paint premixed and 2 pounds on (overlay method); and the other with 6 pounds of Prismo "duck" beads on only (drop-in method). This latter type of application was made only with Prismo Superlifeline and specification paints.

Now it is proposed that the tests be used this year as a basis for the purchase of next year's paint. This presents a difficult problem for several reasons:

- 1). While some of the longitudinal stripes are badly worn due to unusually severe local conditions of traffic and tracking of soils from access roads, the transverse stripes have not progressed far enough to date to give a clear cut quality separation (see attached table). Transverse stripes give a fairer and more dependable picture of quality than the longitudinal since the pavement surface, location, and traffic volumes are

the same for all paints in a given test section. The transverse stripes were $4\frac{1}{2}$ months old at the last evaluation and it will probably be another month or two before significant differences in performance will show up. With the durability being shown by these paints, the time element in performance testing is a serious handicap to purchasing procedure.

2). Two of the paints were not produced to meet our 30-minute maximum drying time requirement, namely 3M Centerlite and L.K.R. Since drying time is a very important requirement, even in a performance specification, these two paints would necessarily be eliminated from consideration in their present form.

3). In view of the primary purposes of the tests, the number of paints included was kept to a minimum. The particular paints selected for test are not necessarily the best that could be found and the field was closed to many producers of quality paint, which may be interpreted as discrimination.

4). The fact that two types of bead systems were involved in these tests introduces a complication in bidding procedure. The results of previous studies favor the two-bead system. Normally only one bead system would be employed in routine performance tests.

5). Last, but by no means least, there can be no certainty that the paint bought on the basis of these tests will be the same as the samples tested. As far as is known at the present time, there is no proven method of chemically analyzing a paint of unknown composition once it has been compounded from its ingredients.

The attached table gives results of transverse stripe tests at an age of $4\frac{1}{2}$ months. Ratings of 0 to 10 were made independently by a committee

of three and averaged. Those who participated in the evaluations were Larkin or Burgess of Maintenance; Bauerle, Rigotti or Long of Planning and Traffic, and Rhodes or Martin of Testing and Research. All test stripes were identified only by code number for the committee at the time evaluations were made. Performance rating is based on four qualities, namely -- color, general appearance, durability, and night visibility. While the practice is sometimes followed of giving all of these qualities equal weight in the evaluation, we feel that durability and night visibility far outweigh the other two in importance and have set up a fifth column in the table showing weighted ratings. These ratings are weighted on the basis of 40 percent for durability, 40 percent for night visibility, and 10 percent each for color and general appearance. For example, the weighted rating of the first paint in the table, MSHD white, was obtained by multiplying the ratings for amount of paint remaining (8) and night visibility (9) by 0.4, and general appearance (9) and color (8) by 0.1 respectively and adding the results.

The longitudinal stripes which are now over 5 months old indicate generally that specification paint and Boydell are wearing most rapidly, although 3M Centerlite is chipping off badly in some areas -- a development which has not become evident in the transverse stripe test section. Department specification paint has been easily superior to all other premix combinations in night visibility. Boydell is a generally unsatisfactory paint, both in wear and excessively fast settling in the container. Prismo Superlifeline was brightest at the beginning but is going down fast now. It is not definitely determined as yet which of the two bead systems -- drop-in or overlay -- gives the greater durability in the present series of tests.

With reference to the first of the two primary objectives stated in the first paragraph of this report, we feel that because of the time, expense, and sampling uncertainties involved in performance testing, we cannot recommend this method as a basis for the annual purchase and acceptance of traffic paint. Rather, performance tests should be carried out with paints of known composition so that the best possible formulation may be found and used as a basis for specification and acceptance. In this way, new and better formulations may be developed for specification purposes through periodic performance tests, and a product of known quality obtained through competitive bidding.

With respect to the second objective, the tests have not reached the point where the order of merit of the various paints can be clearly established, based on the weighted ratings of the four attributes listed above.

SUMMARY OF PERFORMANCE DATA

TRANSVERSE STRIPES, AGE 4-1/2 MONTHS

Paint	Color	Appearance	Color	Paint Rem.	Nite Vis.	Weighted Rating *	Percent of Maximum
M.S.H.D.	white	9	8	8	9	8.5	100
	yellow	8	8	8	9	8.4	99
L.K.R.	white	8	8	9	6	7.6	89
	yellow	9	9	10	6	8.2	96
3-M. Co.	white	8	8	9	8	8.4	99
	yellow	8	8	9	7	8.0	94
Truscon	white	8	8	9	7	8.0	94
	yellow	8	8	9	7	8.0	94
Prismo Premix	white	8	8	9	7	8.0	94
	yellow	8	8	9	7	8.0	94
Boydell	white	8	8	8	6	7.2	85
	yellow	8	8	8	6	7.2	85
Prismo L.L. (beads on only)	white	8	8	8	7	7.6	89
	yellow	8	8	8	8	8.0	94
M.S.H.D. (beads on only)	white	8	8	8	7	7.6	89
	yellow	8	8	8	9	8.4	99

* Durability 40%; Night Visibility 40%; Gen. Appear. 10%; Color 10%.