

MICHIGAN
STATE HIGHWAY DEPARTMENT
Charles M. Ziegler
State Highway Commissioner

ASTM 1956 COOPERATIVE TRAFFIC PAINT TESTS

ASTM Committee D-1, Subcommittee IV, Group 2
Highway Research Project 47 G-36

LAST COPY
DO NOT REMOVE FROM LIBRARY

Research Laboratory
Testing and Research Division
Report No. 277
March 15, 1957

ASTM 1956 COOPERATIVE TRAFFIC PAINT TESTS

In accordance with the decision of Group 2, Subcommittee IV of Committee D-1, to conduct further field and laboratory accelerated durability tests of traffic paints, Michigan in 1956 again participated in field tests.

Three test paints were received from the National Lead Company on February 16, 1956. The painted stripes were rated for durability at monthly intervals for a period of seven months. After seven months exposure, one of the three paints had not reached a point of 50 per cent wear, as determined by ASTM standards, so this value had to be extrapolated. The other two test paints reached the point of 50 per cent wear after five to seven months of service.

FIELD TEST

Three stripes of each paint were applied transversely across both lanes of a four-lane divided highway on US-27 about six miles southwest of Lansing, and also on US-127 on the southeast outskirts of Holt.

The paints were applied on June 12, 1956, with a striper designed specifically for application of experimental traffic paints. None of the paints gave any trouble during stripe application. A summary of the application data is recorded in Table I, including air temperature, relative humidity, wet film thickness, drying time, and stripe width. General views of the test sites and of the stripes after application are shown in the upper photographs of Figures 1 and 2.

A summary of the weather data for the test sites during the duration of the tests was requested and is presented in Table II.

TABLE I

SUMMARY OF APPLICATION DATA

ASTM 1956 Cooperative Tests
June 12, 1956

TEST SECTION 1

Paint No.	Stripe No.	Time A. M.	Air Temp. deg., F*	Rel. Hum. Per cent	Drying Time Min.	Film Thick. Mils**	Stripe Width In.
1	1-3	9:30	86	77	27	18.1	4.0
2	4-6		88	75	21	18.1	4.0
3	7-9	10:30	90	74	38	18.1	4.0

TEST SECTION 2

Paint No.	Stripe No.	Time A. M.	Air Temp. deg., F*	Rel. Hum. Per cent	Drying Time Min.	Film Thick. Mils**	Stripe Width In.
1	1-3	1:40	93	53	18	17.0	4.0
2	4-6		93	56	12	17.0	4.0
3	7-9	2:30	93	59	26	17.0	4.0

*Weather clear with a light west wind, 5-10 mph.

**Determined by gear setting on positive displacement of cylinder on striping machine.

RESULTS

The monthly durability ratings for the three paints in the two test sections are presented graphically in Figure 3. The requested terminal or 50 per cent point of wear ratings are summarized in Table III, which also lists the daily traffic counts for the test sites. The monthly evaluation ratings were made visually, by estimating the area of roadway exposed in each wheel track for a distance of 9 in. each side of the point of greatest wear, in the traffic lane only.

The lower photographs in Figures 1 and 2 show the condition of the paint stripes after seven months of exposure.

DISCUSSION

The paints in these tests generally eroded away, rather than failing because of chipping or scaling. The three paints varied relatively little in durability ratings. All three paints produced durability ratings about equal to or better than the six paints which were field evaluated in the ASTM 1953 Cooperative Field Durability Tests.

TABLE II

WEATHER DATA, FIELD TESTS *

ASTM 1956 Cooperative Tests

Week Beginning	Air Temp. deg., F			Relative Humidity Per cent			No. Days Precip. ¹	No. Days Sunshine ²
	Max.	Min.	Mean	Max.	Min.	Mean		
June 12, 1956	95	60	78.4	92	32	64.5	4	7
19	89	50	73.8	87	41	66.0	2	7
26	90	52	70.7	90	36	60.9	4	7
July 3, 1956	85	58	68.1	87	42	69.6	5	7
10	85	55	70.8	93	31	63.9	3	7
17	81	50	68.7	93	36	64.8	6	7
24	92	50	71.4	93	38	64.3	2	7
31	91	54	63.8	95	34	75.8	6	7
Aug. 7, 1956	86	59	72.6	96	45	74.4	4	7
14	88	48	70.5	92	41	68.4	3	7
21	89	48	64.0	92	34	68.3	4	7
28	90	56	73.0	92	38	67.7	5	7
Sept. 4, 1956	87	41	62.1	94	38	64.4	3	7
11	87	49	63.0	95	38	69.8	2	7
18	74	47	53.3	93	33	62.5	3	7
25	81	38	58.3	95	29	62.6	2	7
Oct. 2, 1956	74	37	55.8	91	23	60.0	2	7
9	83	30	56.6	85	25	54.5	1	7
16	84	38	61.8	97	26	67.3	1	7
23	77	36	54.3	96	30	67.5	1	6
30	75	45	59.1	97	50	80.7	4	4
Nov. 6, 1956	62	21	42.7	90	41	65.5	3	6
13	68	21	41.8	90	33	61.7	3	7
20	56	9	29.0	90	52	76.3	7	3
27	48	17	29.6	89	55	76.2	6	3
Dec. 4, 1956	57	23	36.7	97	64	84.8	5	3
11	44	13	30.3	100	54	77.9	6	2
18	44	16	35.3	97	48	84.9	5	2
25	38	12	28.6	87	51	73.5	7	4
Jan. 1, 1957	35	11	24.3	91	32	65.6	5	5
Total							114	178

¹Occurrence of a trace or more.²Duration of one minute or more

*Data obtained from Local Weather Bureau Station

TABLE III

TEST RESULTS

ASTM 1956 Cooperative Tests

FIELD WEAR TESTS^a

Age of Paint Stripes at 50 Per cent Reduction^b

Test Section	Paint No. 1 ^c	Paint No. 2	Paint No. 3	Stripe Thickness Mils
1	256 days	204 days	181 days	18.1
2	251 days	182 days	161 days	17.0

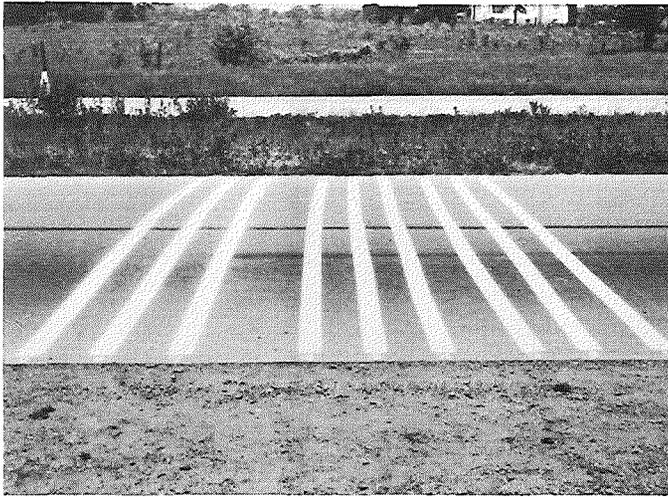
^aPaints evaluated only in traffic lane tire tracks.

^bTraffic Count in vehicles per day:

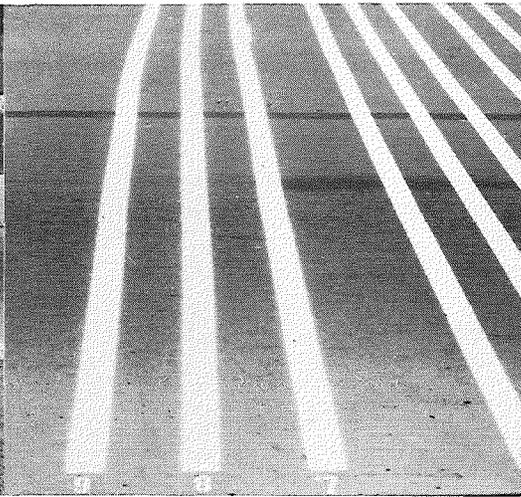
Section 1 - 9,300 including 2,000 commercial.

Section 2 - 7,400 including 1,300 commercial.

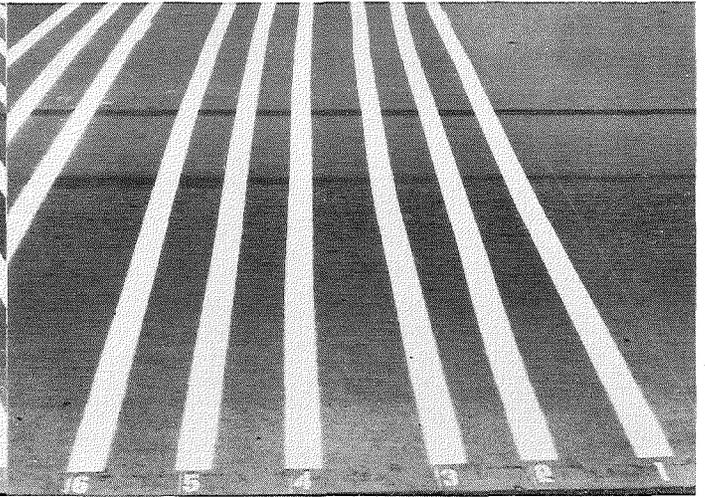
^cValues are extrapolated.



▲ TEST SECTION I. US 27, 6 MILES
SOUTHWEST OF LANSING.



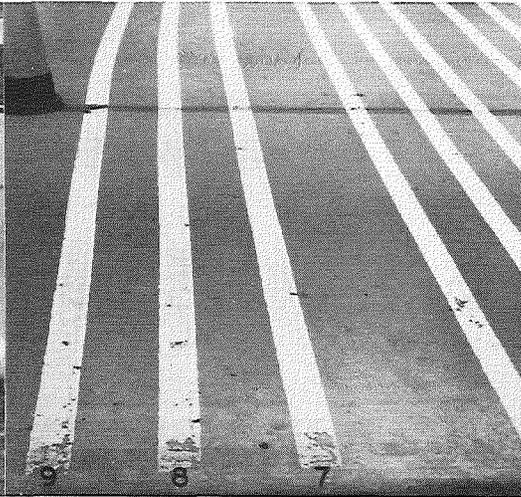
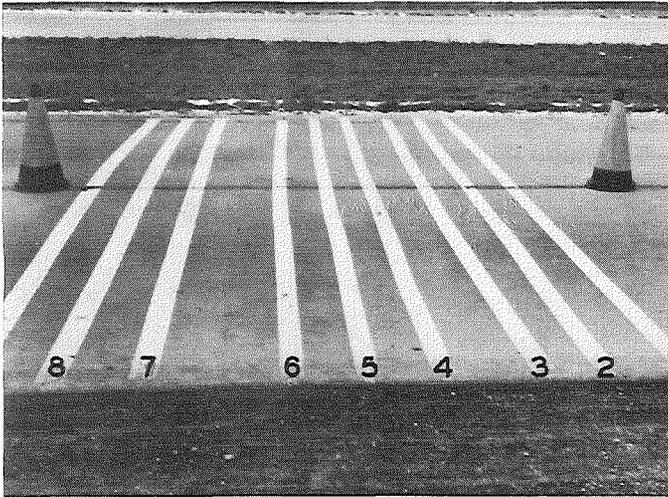
TEST PAINT 3



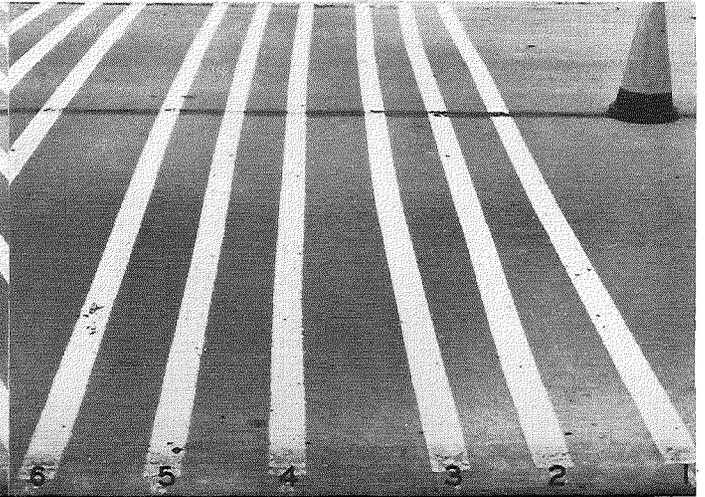
TEST PAINT 2

TEST PAINT 1

APPLIED PAINT STRIPES ON JUNE 12, 1956



TEST PAINT 3

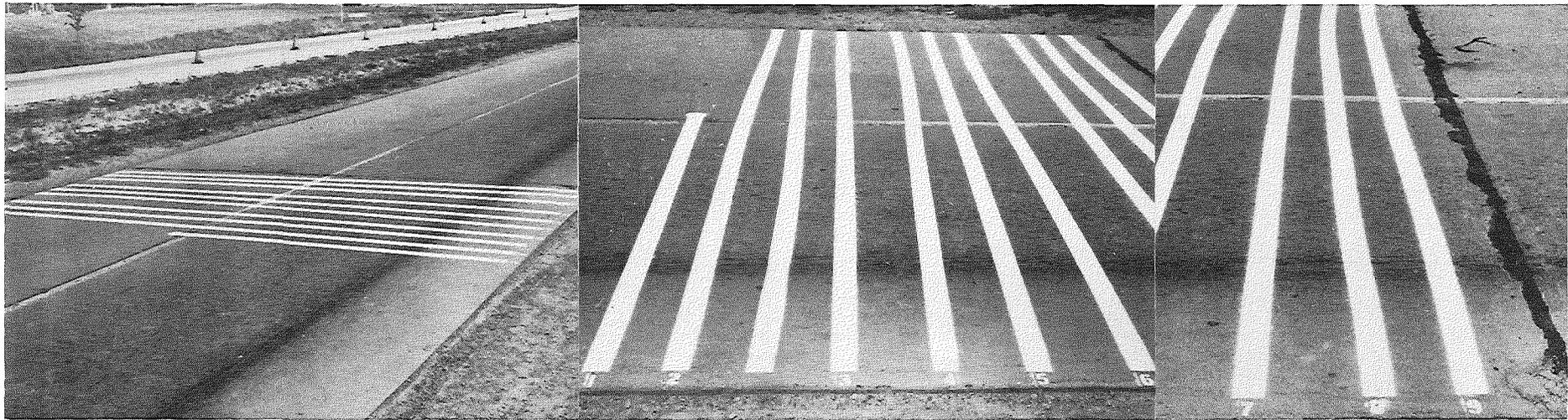


TEST PAINT 2

TEST PAINT 1

FINAL EVALUATION, JANUARY 8, 1957 AFTER 210 DAYS OF EXPOSURE

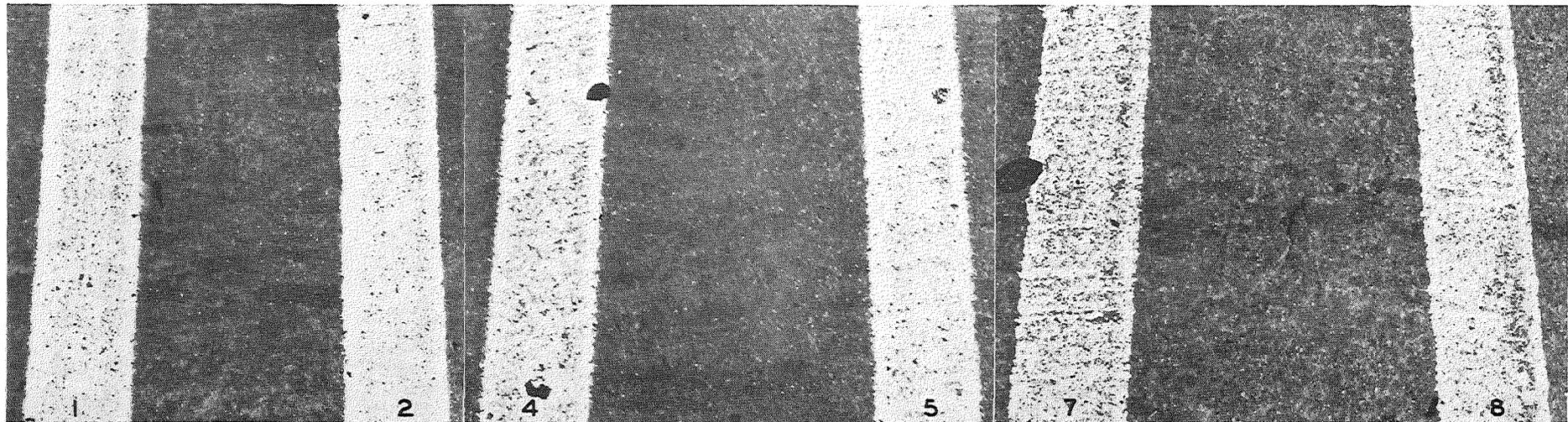
FIGURE I



▲ TEST SECTION 2. US 127 SOUTH EAST
OUTSKIRTS OF HOLT.

TEST PAINT 1 TEST PAINT 2 TEST PAINT 3

APPLIED PAINT STRIPES ON JUNE 12, 1956



TEST PAINT 1 TEST PAINT 2 TEST PAINT 3

FINAL EVALUATION JANUARY 8, 1957 AFTER 210 DAYS OF EXPOSURE
CLOSE-UPS OF OUTSIDE TIRE TRACK IN TRAFFIC LANE

FIGURE 2

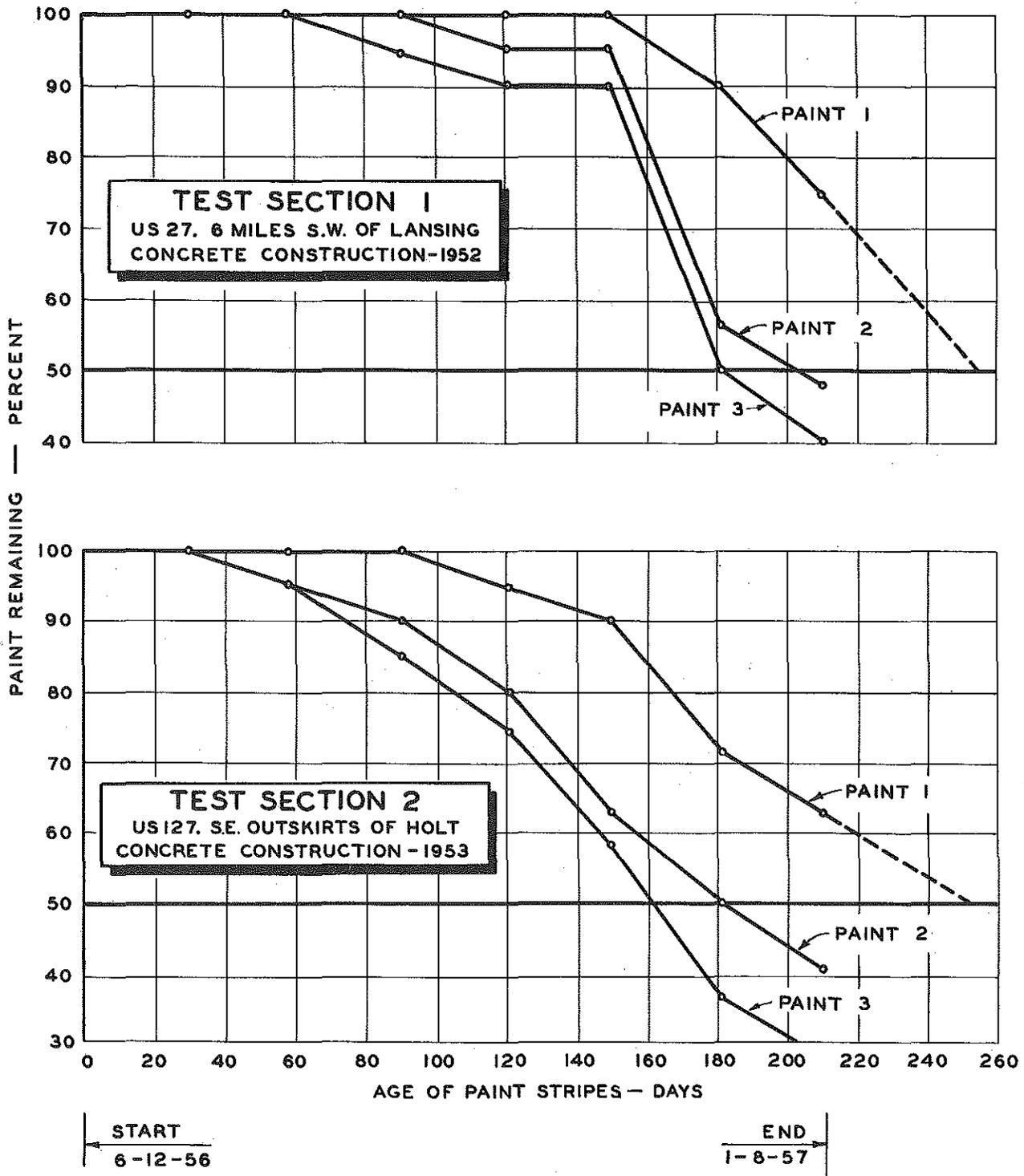


FIGURE 3. DURABILITY RATINGS OF PAINTS IN TRAFFIC LANES ONLY