

1959 PERFORMANCE TESTS
ON WHITE AND YELLOW TRAFFIC PAINTS

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Michigan State Highway Department
John C. Mackie, Commissioner
Lansing, October 1960

1959 PERFORMANCE TESTS ON WHITE AND YELLOW TRAFFIC PAINTS

Each of eleven producers submitted one white and one yellow traffic paint for the 1959 performance tests. Four experimental paints were added including: (a) two yellow paints in continuation of the Research Laboratory Division's evaluation of alkyd resins as traffic paint binders, (b) a synthetic rubber-based white paint, and (c) a white paint having Committee authorization to field evaluate the efficiency of its crushed-glass reflector content.

The sources of the test paints were:

1. Acme Quality Paints, Inc., Detroit
2. Baltimore Paint & Chemical Co., Baltimore
3. Berry Brothers Co., Detroit
4. Boydell Brothers Co., Detroit
5. Glidden Co., Cleveland
6. Jaegle Paint & Varnish Co., Philadelphia
7. O'Brien Corp., South Bend
8. Prismo Safety Corp., Huntingdon, Pa.
9. Silver Lead Paint Co., Lansing
10. Stiles Paint Co., Kalamazoo
11. Truscon Laboratories, Detroit
12. MSHD Nos. 15A and 15B Yellow Experimental Traffic Paints
13. Firestone R-800 White Experimental Traffic Paint
14. Saf-T-Glow (Berry Bros. Co.) White Experimental Traffic Paint

The Celucoat Company of St. Louis, given a prequalified rating by Committee for the 1959 tests, did not submit paints as it was then undergoing a reorganization culminating in a change of name to Plas-Chem Corporation.

Qualification Tests

This year all of the submitted test paints were deposited for field evaluation; subsequently all paints were evaluated for conformance to the qualification requirements given in governing specifications dated April 17,

1958. Laboratory qualification tests cover color, reflectivity, consistency, bleeding and settling, while the field qualification tests cover drying time of the traffic paints, and applicability in regular highway striping equipment.

Results of the tests are given in Table 1, which, as reported to Committee by letter of April 28, 1960, show that the following paints failed to meet one or more of the requirements as indicated:

White Paints

- No. 130 Paint satisfactory, but supplied beads, evaluated in stripes, did not meet Type III Specifications; were more coarse.
- No. 136 Excessive bleeding on tar base.
- No. 140 Low viscosity; road-striping crew complained about its applicability.
- No. 142 Low viscosity and reflectivity; striping crew complained about its applicability.
- No. 146 Excessive bleeding on tar base; striping crew complained about its handling.
- No. 148 Excessive bleeding on tar base.
- No. 150 High viscosity, increasing with length of storage, resulting in poor sprayability in performance striper; low settling index.
- No. 152 Excessive bleeding on asphalt; very low settling index.

Yellow Paints

- No. 129 Did not match color standard; striping crew complained about its handling.
- No. 131 Paint satisfactory, but supplied beads, evaluated in stripes, did not meet Type III Specifications; were more coarse.
- No. 133 Vehicle instability during storage.

TABLE 1
 QUALIFICATION TEST RESULTS
 1959 Performance Paints

Paint No.	Color	Reflectivity, percent	Consistency, K. U. - 77 F	Bleeding Index		Settling Index	Drying Time Field - Aug. Minutes	Applicability in Striping Equipment*
				Asphalt	Tar			
White								
128		86.4	77	7.0	4.0	7	31	S
130		92.8	73	5.0	6.0	7	28	S
132		86.3	76	6.0	4.0	8	30	S
134		92.4	72	7.0	4.0	7	33	S
136		85.1	67	5.0	3.0	7	25	S
138		96.6	72	6.0	5.0	7	21	S
140		86.5	62	6.0	4.0	6	28	NS
142		78.1	62	4.0	5.0	7	28	NS
144		83.7	77	4.0	4.0	8	22	S
146		87.3	67	6.0	3.0	6	29	NS
148		80.2	74	6.0	3.0	7	30	S
150		86.8	88	9.0	6.0	4	17	(NS)**
152		90.1	76	2.0	5.0	2	39	---
Yellow								
129	NPg	63.1	76	4.0	6.0	6	29	NS
131	Pg	60.6	72	8.0	5.0	7.5	29	S
133	Po	59.4	77	6.0	6.0	9	19	S
135	Pg	62.7	72	8.0	6.0	8	32	S
137	Po	59.0	67	6.0	4.5	8.5	43	S
139	Pg	60.8	71	7.0	7.0	6.5	45	S
141	Po	51.2	62	5.0	5.5	6	34	NS
143	Po	50.8	62	2.0	7.0	7.5	33	NS
145	Pg	57.6	77	10.0	4.0	8	38	S
147	Pr	53.9	62	3.0	5.0	7.5	33	NS
149	Po	51.0	72	4.0	5.0	6	40	S
151	Po	56.5	73	3.0	4.0	8.5	30	---
153	Po	56.5	67	---	---	8	56	---

* S = satisfactory; NS = not satisfactory as determined by field crew.

** Determined by application in performance areas.

No. 141 Low viscosity; striping crew complained about its applicability.

No. 143 Excessive bleeding on asphalt base, and low viscosity; striping crew complained about its applicability.

No. 147 Excessive bleeding on asphalt base; striping crew complained about its applicability.

No. 151 Excessive bleeding on asphalt base.

No. 153 Excessive field drying time.

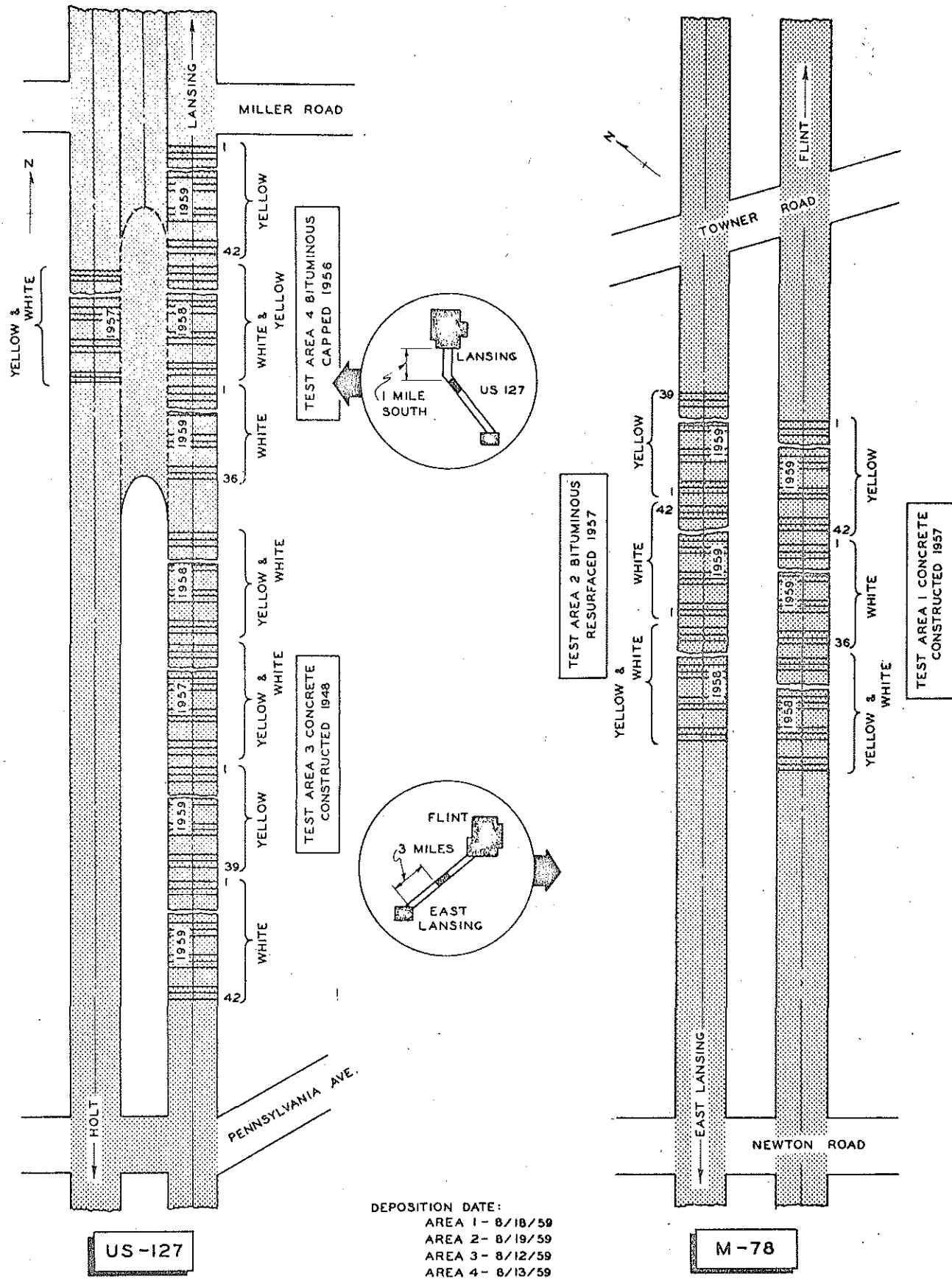


Figure 1. Location of 1959 Traffic Paint Performance Tests
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Field Application

Paints submitted for the 1959 tests were deposited in field areas in the period August 12-19, 1959. The field areas, including two concrete and two bituminous roadways, were the same as in 1958, with specific locations as shown in Fig. 1. The areas, covering two lanes of divided four-lane roadways, were located as follows:

- No. 1. M 78 three miles east of East Lansing, concrete, south roadway.
- No. 2. M 78 three miles east of East Lansing, bituminous, north roadway.
- No. 3. US 127 between Miller Road and Pennsylvania Avenue extension, concrete, east roadway.
- No. 4. US 127 between Miller Road and Pennsylvania Avenue extension, bituminous, east roadway.

Each test paint was deposited in an area as a series of three transverse stripes; the standard paints in all four areas, the experimental paints usually in fewer areas.

All paints were applied as stripes of 15-mil wet thickness, which is equivalent to a paint application rate of 16.5 gal per mile of 4-in. stripe, since no other stripe thickness recommendations were received from any of the producers. For the same reason, glass beads were applied to the test stripes in the ratio of 6 lb per gal of paint, except for the white experimental paint containing crushed glass which received a bead complement of 2 lb per gal.

In accordance with governing specifications, reflectorizing beads were added to all stripes by the "drop-in" method with glass beads conforming to MSHD Type III Specifications, except for Prismo paints which received their own beads that were coarser than Type III.

All paints were applied across two highway lanes, traffic and passing, as 4-in. transverse stripes. The order of application of test paints was again rotated in the four areas, as shown in Table 2, to compensate for any inequalities arising from differences in the time or order of application. The stripes were identified only by numbers which, in any area, increased consecutively in order of application.

TABLE 2
SUMMARY OF APPLICATION DATA

		Paint No.	Stripe Nos.	Application Time	Air Temp. F	Relative Humidity percent	Weight Difference percent	Weather		
TEST AREA ① M 78, 3 MILES EAST OF EAST LANSING, CONCRETE 24 FEET, SOUTH ROADWAY, CONSTRUCTED 1957	8-18-1959	130	1-3	11:45	82	61	-4.4	Sunny, clear, with light breeze.	WHITE	
		140	4-6				-5.0			
		142	7-9							
		144	10-12							
		146	13-15							
		148	16-18							
		102	19-21				-4.2			
		128	22-24							
		132	25-27							
		134	28-30							
		136	31-33				-5.0			
		138	34-36	1:30	83	55	-0.7			
		8-18-1959	141	1-3	10:00	77	75		Sunny, clear, with light breeze.	YELLOW
			143	4-6						
			145	7-9						
			147	10-12						
			149	13-15						
			151	16-18						
			153	19-21				-2.0		
			97	22-24						
		129	25-27							
		133	28-30							
		135	31-33				-3.7			
		137	34-36				-5.0			
		139	37-39							
		131	40-42	11:30	79	67				
TEST AREA ② M 78, 3 MILES EAST OF EAST LANSING, BITUMINOUS 24 FEET, NORTH ROADWAY, CAPPED 1957	8-19-1959	152	1-3	10:00	80	68	-1.5	Sunny, clear, with 10-15 mph wind.	WHITE	
		138	4-6							
		136	7-9				-1.5			
		134	10-12				-4.3			
		132	13-15							
		128	16-18				-4.7			
		102	19-21							
		148	22-24				-5.0			
		146	25-27				-0.9			
		144	28-30							
		142	31-33							
		140	34-36				-4.3			
		150	37-39							
		130	40-42	11:30	84	62				
		8-19-1959	131	1-3	12:00	84	62	-3.5	Sunny, clear, with 10-15 mph wind	YELLOW
			133	4-6						
			135	7-9				-1.8		
			137	10-12						
			139	13-15				-2.6		
			141	16-18						
		143	19-21				-0.7			
		145	22-24							
		147	25-27				-2.2			
		149	28-30							
		151	31-33				-4.6			
		129	34-36				-3.5			
		97	37-39	1:45	87	59				

TABLE 2 (Con't)
SUMMARY OF APPLICATION DATA

		Paint Nos.	Stripe Nos.	Application Time	Air Temp, F	Relative Humidity percent	Atomization Pressure psig	Weather							
TEST AREA ③ US 127, SOUTH OF MILLER ROAD, CONCRETE 22 FEET, EAST ROADWAY, CONSTRUCTED 1948	8 - 12 - 1959	130	1-3	11:00	82	65	35	Sunny, overcast, with 5-15 mph wind	WHITE						
		128	4-6												
		132	7-9												
		134	10-12												
		136	13-15												
		138	16-18												
		140	19-21												
		142	22-24												
		144	25-27												
		146	28-30												
	8 - 12 - 1959	148	31-33	1:00	86	63	70								
		152	34-36												
		102	37-39												
		150	40-42												
		151	1-3							9:45	79	71	25	Sunny, overcast, with 5-10 mph wind	YELLOW
		149	4-6												
		147	7-9												
		145	10-12												
		143	13-15												
		141	16-18												
139	19-21														
137	22-24														
135	25-27														
133	28-30														
TEST AREA ④ US 127, SOUTH OF MILLER ROAD, BITUMINOUS 22 FEET, EAST ROADWAY, CAPPED 1956	8 - 13 - 1959	129	31-33	10:45	80	67	35								
		97	34-36												
		131	37-39												
		102	1-3							9:30	80	75	45	Sunny, overcast, with light breeze.	WHITE
		148	4-6												
		146	7-9												
		144	10-12												
		142	13-15												
		140	16-18												
		138	19-21												
	136	22-24													
	134	25-27													
	132	28-30													
	8 - 13 - 1959	128	31-33	10:45	82	72	35								
		130	34-36												
		131	1-3							11:00	85	69	35	Sunny, overcast, with light breeze.	YELLOW
		97	4-6												
		129	7-9												
		133	10-12												
		135	13-15												
137		16-18													
139		19-21													
141		22-24													
143	25-27														
145	28-30														
8 - 13 - 1959	147	31-33	1:15	90	65	15									
	149	34-36													
	151	37-39													
	153	40-42													

Detailed observations again were made by Laboratory personnel during application of test paints, including air temperature, relative humidity, atomization pressure and weight checks on application rate, as listed in Table 2.

No difficulty was experienced in depositing any of the standard paints, though the rubber-based experimental white had poor sprayability in the application equipment used in performance areas, two of which are shown in Fig. 2.

Forty-five gallon amounts of each standard paint submitted for the 1959 tests were applied as longitudinal stripes by the Grand Rapids striping crew in order to evaluate handling and application characteristics of the paints in highway striping equipment. The crew commented that they encountered some trouble, as tabulated in Table 1, in applying white paints from Silver Lead (low viscosity), Truscon (low viscosity), Glidden (difficult to remix); and yellow paints from Boydell (difficult to remix), Silver Lead (low viscosity), Truscon (low viscosity), Glidden (low viscosity).

Field-Performance Ratings

Test stripes deposited in the four performance areas were rated 9 days after application, and at three-month intervals thereafter over a period of one year.

Quality ratings from the four test areas, averaged from the findings of the four observers, are tabulated for the test paints in Table 3. These averaged quality values for the individual paints were then used to evaluate the respective weighted ratings, listed in Table 3.

Field Test Results

As in previous years there was considerable difference in the quality ratings of the evaluated paints in the four test sections. As previously, test paints deteriorated considerably faster in test areas of US 127 than in the two other sections, this year located on M 78, which had about half the traffic density of the former, with the majority of the paints showing fastest deterioration in the concrete test area on US 127. The terminal condition of some test stripes is shown in Fig. 3.

Table 4 contains a summary of evaluation values for all 1959 tested paints, listed in descending order of terminal "Percent of Best" values.



Figure 2. 1959 performance areas shortly after deposition of striping: Area 2, bituminous, in top photo, white and yellow stripes in background adjoining 1958 whites in foreground. Area 4, bituminous, in lower photo with yellow stripes in foreground, and 1958 or older striping in background.

**TABLE 3
HIGHWAY PERFORMANCE DATA**

Exposure Days	Factor Evaluated	White Paint Numbers															
		102	128	130	132	134	136	138	140	142	144	146	148	150	152 B	152 U	
WHITE PAINTS	9	General Appearance	9.2	9.2	9.4	9.0	8.9	9.5	10.0	9.5	8.4	9.7	9.5	9.4	8.1	10.0	10.0
		Durability	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.8	9.8	9.9	9.9	10.0
		Night Visibility	7.9	5.5	8.2	9.1	7.3	3.6	3.9	2.8	3.2	3.8	3.7	3.5	3.6	3.6	3.1
		Weighted Rating	8.9	7.7	9.0	9.4	8.5	6.8	7.0	6.4	6.4	6.9	6.7	6.6	8.4	6.8	6.6
	90	General Appearance	6.5	6.5	7.3	6.4	6.5	7.0	6.8	6.7	5.2	8.0	7.0	7.0	2.5	7.8	7.2
		Durability	9.0	8.7	9.1	9.2	9.3	8.9	7.7	8.9	7.9	9.2	8.4	8.2	5.7	8.6	7.5
		Night Visibility	7.0	5.7	7.1	7.8	7.0	4.8	5.3	4.7	3.2	5.4	4.4	4.1	2.2	4.3	2.2
		Weighted Rating	7.8	7.0	7.9	8.2	7.9	6.7	6.4	6.6	5.3	7.2	6.3	6.0	3.6	6.4	4.8
	195	Service Factor	83.1	73.3	84.8	88.4	82.1	67.1	66.8	64.7	58.6	70.3	64.9	63.2	60.0	65.7	56.9
		General Appearance	5.5	4.3	5.0	5.4	6.3	5.0	2.6	6.3	2.2	5.3	3.4	4.1	1.4	5.1	4.6
		Durability	6.1	4.9	5.7	5.9	7.2	5.5	2.6	6.8	2.5	5.8	3.6	4.3	3.0	5.2	4.7
		Night Visibility	3.0	2.6	3.3	2.6	4.4	3.0	1.8	4.3	0.8	4.1	1.7	1.9	0.9	3.6	1.9
	278	Weighted Rating	4.5	3.7	4.4	4.2	5.7	4.2	2.2	5.5	1.6	4.9	2.6	3.1	1.8	4.4	3.3
		Service Factor	71.3	62.6	72.4	74.1	74.4	60.2	54.0	62.4	45.6	65.4	53.9	53.7	42.3	59.2	48.1
		General Appearance	4.2	3.4	3.7	4.0	4.8	3.8	1.7	4.8	1.3	3.8	2.1	2.5	0.7	3.6	1.0
		Durability	4.8	3.7	4.3	4.5	5.7	4.3	1.9	5.3	1.6	4.6	2.5	2.0	1.1	3.5	3.5
379	Night Visibility	1.9	1.7	2.2	1.4	2.9	2.4	1.5	3.1	0.3	2.8	1.0	1.2	0.5	3.6	1.7	
	Weighted Rating	3.3	2.7	3.2	2.9	4.2	3.3	1.7	4.2	0.9	3.6	1.7	1.9	0.8	3.6	2.4	
	General Appearance	3.6	3.0	3.4	3.3	4.5	3.1	1.5	4.1	1.0	3.4	1.9	2.2	0.8	2.8	2.8	
	Durability	3.9	3.1	3.5	3.4	4.8	3.2	1.6	4.2	1.1	3.7	2.0	2.3	1.0	2.9	2.9	
379	Night Visibility	2.0	1.6	2.3	1.5	2.7	2.1	0.9	3.1	0.5	2.7	1.2	1.2	0.6	2.4	1.4	
	Weighted Rating	2.9	2.3	2.9	2.4	3.7	2.6	1.2	3.6	0.8	3.2	1.6	1.7	0.9	2.6	2.1	
	Service Factor	53.5	45.9	53.7	53.0	59.8	47.1	35.9	53.1	28.5	52.1	36.9	37.9	26.6	47.5	36.9	
YELLOW PAINTS	9	Yellow Paint Numbers															
			97	129	131	133	135	137	139	141	143	145	147	149	151	153	
		General Appearance	9.8	9.5	9.7	9.9	9.7	9.8	9.8	9.8	9.2	9.8	9.3	9.5	9.8	9.4	
		Durability	10.0	10.0	10.0	9.9	10.0	10.0	9.6	10.0	10.0	10.0	9.5	9.7	10.0	10.0	
	90	Night Visibility	4.4	5.0	8.1	7.3	7.7	4.1	4.0	3.3	3.9	5.1	3.6	4.3	3.5	4.4	
		Weighted Rating	7.2	7.4	9.0	8.6	8.8	7.0	6.8	6.6	6.8	7.5	6.5	7.0	6.7	7.1	
		General Appearance	8.2	6.4	8.1	7.5	7.8	7.8	7.2	6.9	6.0	8.0	6.5	7.2	7.6	7.6	
		Durability	8.7	7.5	9.3	7.9	9.5	8.8	8.4	8.9	7.4	9.1	7.2	8.3	8.3	9.2	
	195	Night Visibility	5.4	3.9	6.7	5.6	7.1	5.1	4.8	4.3	3.2	6.3	4.1	4.4	4.7	6.3	
		Weighted Rating	7.0	5.6	7.9	6.7	8.1	6.8	6.5	6.4	5.2	7.6	5.6	6.2	6.4	7.6	
		Service Factor	70.9	65.4	84.5	76.6	84.8	69.4	68.5	65.2	60.2	75.6	60.6	66.1	65.8	73.7	
		General Appearance	6.4	1.1	7.0	5.0	7.1	6.2	3.9	6.2	1.8	6.8	2.3	2.5	6.3	6.3	
	278	Durability	6.9	1.2	7.2	5.2	7.5	6.8	4.0	6.7	2.0	7.3	2.5	2.8	5.9	7.1	
		Night Visibility	5.1	0.6	3.4	2.4	4.4	4.1	2.2	3.9	0.6	5.3	1.0	1.0	3.7	4.6	
		Weighted Rating	6.0	0.9	5.3	3.8	5.9	5.4	3.1	5.2	1.3	6.2	1.7	1.9	4.7	5.8	
		Service Factor	68.0	47.7	74.4	63.9	76.9	65.0	56.5	61.5	45.1	72.2	47.6	52.3	60.4	70.0	
379	General Appearance	5.4	0.5	5.4	3.7	5.8	5.4	2.8	4.7	1.1	5.8	1.4	1.4	4.1	5.2		
	Durability	5.9	0.6	5.6	3.8	5.9	5.9	2.6	5.4	1.5	6.0	1.5	1.4	4.5	6.2		
	Night Visibility	4.0	0.5	2.8	1.5	3.2	3.2	1.3	2.7	0.4	3.7	0.8	0.4	2.6	2.5		
	Weighted Rating	4.9	0.5	4.2	2.6	4.5	4.5	2.0	4.0	0.9	4.8	1.1	0.9	3.5	4.2		
379	General Appearance	4.5	0.6	4.6	2.8	4.7	4.2	2.0	3.5	0.7	5.1	1.0	1.0	3.6	4.7		
	Durability	4.5	0.6	4.5	2.8	4.8	4.1	2.1	3.6	0.5	5.1	1.1	1.0	3.7	5.0		
	Night Visibility	3.6	0.4	2.9	1.5	3.1	2.9	1.4	3.0	0.2	3.8	0.6	0.5	2.2	2.5		
	Weighted Rating	4.0	0.5	3.8	2.2	3.9	3.5	1.7	3.3	0.4	4.4	0.8	0.8	2.9	3.7		
379	Service Factor	58.0	27.5	59.2	46.3	62.3	55.0	39.6	51.4	27.3	61.6	30.3	32.6	48.3	57.6		

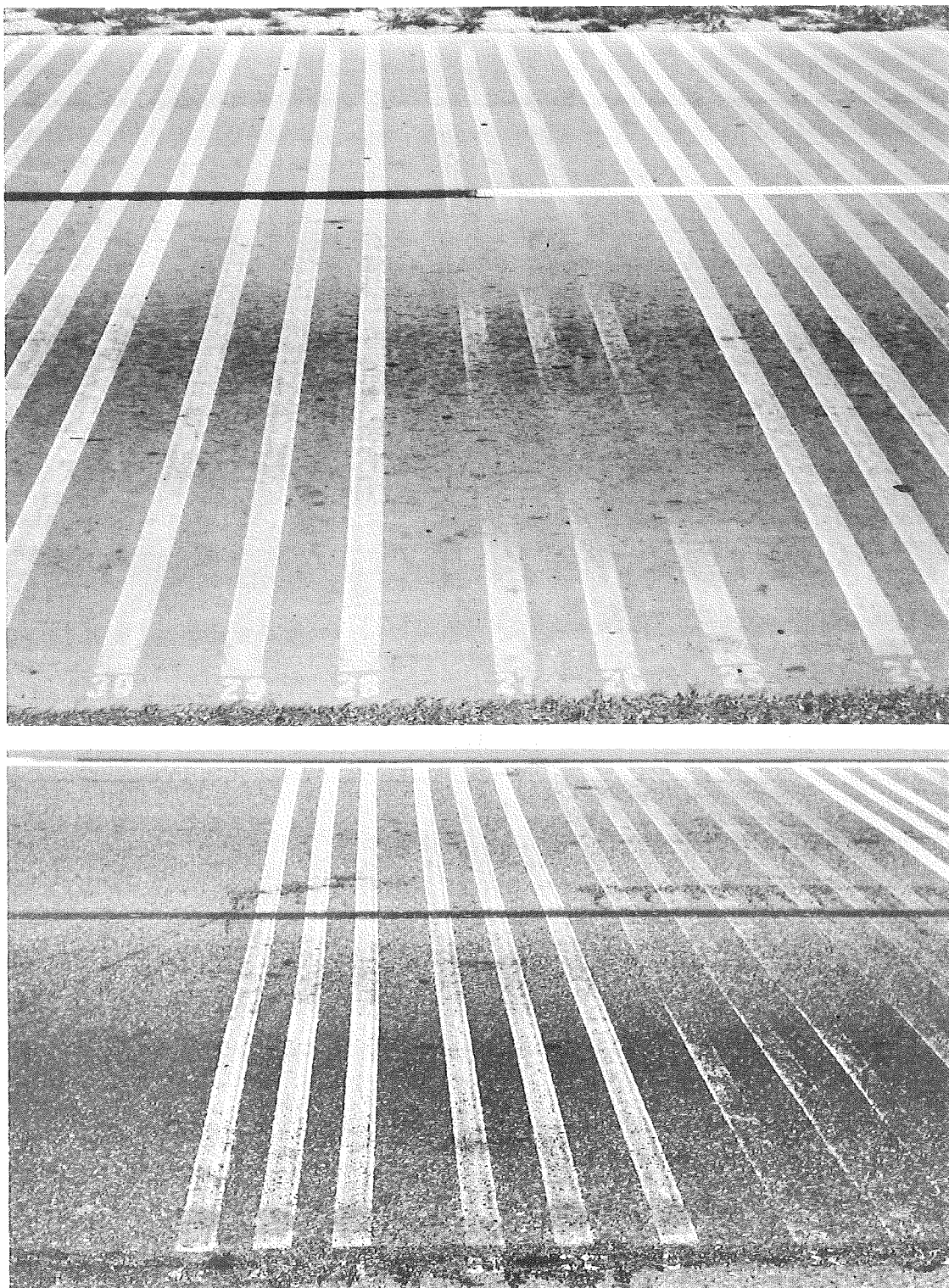


Figure 3. Some 1959 stripes after one year's exposure in test areas. Upper photo shows condition of yellow stripes 22 to 23 on concrete of M 78; stripes 22-24 are yellow paint purchased for highway striping in 1959. Lower photo shows yellow stripes 36 to 42 on black-top of US 127; stripes 39-42 represent Laboratory experimental paints.

TABLE 4
SERVICE FACTORS AND TERMINAL RATINGS
1959 Performance Paints*

	1958 Service Factor 374 days (a)	Paint Number	1959 Service Factor		Percent of Best	Qualification Tests (b)
			195 days	379 days		
WHITE PAINTS	59.8	134	74.4	59.8	100.0	P
	59.1	130 (c)	72.4	53.7	89.8	P - Paint NP - Beads
	54.4	140	62.4	53.1	88.8	
	----	132	74.1	53.0	88.6	P
	50.6	144	65.4	52.1	87.1	P
	47.9	136	60.2	47.1	78.8	NP
	46.3	128	62.6	45.9	76.8	P
	----	148	53.7	37.9	63.4	NP
	58.8	146	53.9	36.9	61.7	NP
	----	138	54.0	35.9	60.0	P
	47.2	142	45.6	28.5	47.7	NP
	----	d) 152 Exp. (e)	59.2	47.5	79.4	NP
	----	d) 152 Exp. (f)	48.1	36.9	61.7	NP
	----	d) 150 Exp.	42.3	26.6	44.5	NP
57.5(g)	1959 Acceptance	71.3	53.5	89.5	P	
YELLOW PAINTS	58.3	135	76.9	62.3	100.0	P
	57.1	145	72.2	61.6	98.9	P
	57.8	131 (c)	74.4	59.2	95.0	P - Paint NP - Beads
	47.2	137	65.0	55.0	88.3	
	56.1	141	61.5	51.4	82.5	NP
	56.9	133	63.9	46.3	74.3	NP
	----	139	56.5	39.6	63.6	P
	----	149	52.3	32.6	52.3	P
	52.4	147	47.6	30.3	48.6	NP
	42.4	129	47.7	27.5	44.1	NP
	62.7	143	45.1	27.3	43.8	NP
	50.6	d) 153 Exp.	70.0	57.6	92.5	NP
	50.6	151 Exp.	60.4	48.8	78.3	NP
	66.5(g)	1959 Acceptance	68.0	58.9	94.5	P

* All paints applied at rate of 16.5 gal per mile of 4-in. stripe;
6 lb of MSHD type III beads dropped-on per gallon except as
noted.

- a) Same areas as in 1958 tests.
- b) P = passing; NP = not passing.
- c) Paints supplied with own beads, coarser than MSHD type III.
- d) Applied in two areas only; 1 concrete and 1 bituminous.
- e) 2 lb of Type III beads dropped-on per gallon of paint.
- f) Paint containing premixed crushed glass, applied without bead overlay.
- g) Values were obtained in 1957 tests, when two areas were different than in 1959 tests.

Half-year and one-year service factor values for all test paints are tabulated in Table 4, which also contains a column summarizing results of the previously mentioned qualification tests.

The "Qualification Tests" column in Table 4 shows that five of eleven white paints and five of eleven yellow paints failed to meet all specification requirements; and in addition one producer's paints, submitted as a package of paint and beads, had beads which failed to meet Department specifications, since they were coarser, as shown in Table 5. The above summary shows that about 50 percent of the submitted paints are subject to disapproval for bid requests because of failure to meet all specification requirements, and in that respect it is a somewhat better average than last year.

TABLE 5
TEST RESULTS ON GLASS BEADS
Submitted with White Paint No. 130 and Yellow Paint No. 131

MSHD Specification Requirements	Type III Beads	Test Beads
Gradation, Weight Percent Passing:		
Sieve No. 30	100	90.3
40	60-90	56.4
70	30-60	5.1
230	0-5	2.1
Specific Intensity, cp/ft/sq ft	0.75 min.	0.83
Chemical Stability, specific intensity after refluxing	0.67 min.	0.81
Index of Refraction	1.50 min.	1.53
Moisture-Resistant Treatment	----	No

Beads do not meet specification gradation requirement. They are considerably coarser.

The Table 4 column listing the terminal service factor values of paints submitted for 1958 tests by the same producers supplying paints for the 1959 tests, is given to permit evaluation of comparative performance of a producer's paints.

As last year, the current tests included stripes of samples of white and yellow paints purchased for Departmental 1959 roadway striping. This was done to give information on duplication ability of ratings, and to serve as a check on analytical methods employed in the laboratory. A comparison of data in Table 4 shows that these paints received somewhat lower service factor ratings than did their prototypes submitted for the 1957 performance tests. These checks are, however, considered satisfactory in view of fact that 1959 tests included two different, and considered tougher areas, than used in 1957 tests.

Examination of data in Table 4 on experimental paints shows that: (a) Saf-T-Glow white paint containing premixed crushed glass displayed poor road performance which was improved by overlay of beads, and that paint did not pass qualification tests, (b) white rubber-based paint displayed poor road performance, had poor applicability, and did not pass qualification tests, and (c) laboratory experimental yellow paints need improvement.

No recommendation is being made concerning standard performance paints to be selected for bids.