

MICHIGAN
STATE HIGHWAY DEPARTMENT
Charles M. Ziegler
State Highway Commissioner

NEOPRENE PREMOLDED JOINT SEAL STUDY
CONSTRUCTION PROJECT F 34-15, C4 on M-66
Progress Report No. 4

By

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Research Project 36G-4(3h)

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Testing and Research Division
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At the request of Mr. H. C. Coons, Deputy Highway Commissioner and Chief Engineer, and by permission of the Bureau of Public Roads, thirty Neoprene-sealed contraction joints were installed on Project F 34-15, C4; F 412 (4) on Route M-66 between M-43 and US-16, at the stations given in Table I. Mr. H. C. Cash, Acting Construction Engineer, and personnel of the Road Division cooperated in the installation, which took place between October 17 and 19, 1949.

Progress Report No. 1 (Report No. 139) by E. A. Finney, dated November 15, 1949, included construction details and a table giving the finished condition of the joints immediately after completion of the project. Progress Report No. 2 (Report No. 161) presented the results of field inspections made on August 11, 1950, and June 7, 1951, by B. W. Pocock and William Martin of the Research Laboratory. Progress Report No. 3 (Report No. 196) contained the results of a similar field inspection made on August 3, 1953, by William C. Broughton of the Research Laboratory. This report includes pictures taken by Thomas C. Holmes, also of the Research Laboratory. The present report, which follows the pattern of Progress Reports No. 2 and No. 3, includes the results of a field inspection made by W. C. Broughton, A. A. Smith, and T. C. Holmes of the Research Laboratory, the pictures being taken by Mr. Holmes.

This latest inspection was carried out on June 9, 1954. It was found that the Neoprene joints under observation have spalled an additional 84.5 feet since the 1953 survey. In many cases, during the same period, spalled areas have increased in width by amounts ranging up to 1 foot. Eight additional Neoprene joints have developed spalling, while 16 of the 19 previously showing spalling have continued to deteriorate. Twenty-seven of the 30 Neoprene

TABLE NO. 1

COMPARISON OF JOINT CONDITION DATA AS OF AUGUST 1953 & JUNE 1954

Joint No.	Station	Amount of Spalling August 3	Amount of Spalling June 9	Increase	Remarks
1	91+00	13.0	15.0	2.0	
2	91+99	16.0	16.0	0.0	
3	92+98	7.0	9.0	2.0	
4	94+96	0.5	1.0	0.5	Cor. break at CL
5	95+95	6.0	9.0	3.0	Cor. break at CL
6	96+94	0.0	0.0	0.0	
7	101+33	5.0	5.5	0.5	
8	103+31	6.0	6.0	0.0	
9	104+30	13.0	15.0	2.0	Widened
10	105+29	3.0	5.0	2.0	
11	107+27	0.0	0.0	0.0	Still Perfect
12	108+26	0.0	4.0	4.0	
13	109+25	13.0	13.0	0.0	
14	111+23	2.0	2.0	0.0	
15	112+22	2.0	2.0	0.0	
16	113+21	14.0	15.0	1.0	Widened D cracking
17	115+19	0.0	0.0	0.0	
18	116+18	0.0	22.0	22.0	Under Black Top
19	117+39	2.0	13.0	11.0	Bad Blow Out
20	119+37	5.0	5.0	0.0	
21	120+36	2.5	15.0	12.5	Widened
22	121+35	4.0	5.0	1.0	Widened
23	123+33	4.0	4.0	0.0	
24	124+32	9.0	11.0	2.0	Widened & Blow out
25	125+31	0.0	2.0	2.0	Cor. break
26	127+29	16.0	20.0	4.0	Widened
27	128+28	5.0	8.0	3.0	Widened
28	129+27	5.0	13.0	8.0	D Cracking
29	131+25	13.0	15.0	2.0	Widened
30	132+24	2.0	2.0	0.0	
Totals		168.0	252.5	84.5	Increase

Total lineal ft. of Neoprene joint installed -- 660 L. F.

Lineal ft. spalled 1949 --- 0 Installed
 Lineal ft. spalled 1951 --- 63.7 Installed or 9.7% spalled
 Lineal ft. spalled 1953 --- 168.0 Installed or 25.5% spalled
 Lineal ft. spalled 1954 --- 252.5 Installed or 38.2% spalled

joints originally installed now show spalling affecting from 5 to 100 percent of the joint length.

Table I presents data showing the condition of the Neoprene joints at the time of the 1953 and 1954 inspections and the increase in spalling which has occurred at each joint since the August, 1953 survey plus the per cent of spalling found during each inspection, while Figures 1 through 8 (plates No. I and II) pictorially compare the 1953 and 1954 condition of several typical Neoprene joints. A condition survey drawing showing both the cracking and the joint conditions as found in the various surveys is attached as Plate No. 3.

Of the 14 regular or standard pavement joints located within the test installation area, one, an expansion joint at Station 102+32, has developed a fairly bad case of D cracking. This condition was first noticed during the 1953 inspection and has become worse in the past year. The other regular joints appear to be in good condition.

In connection with the June 7, 1951 survey, an inspection was made of the regular construction joints located between Stations 59+00 and 91+00. These joints, which had been installed by the contractor who put in the Neoprene joints, were used for comparison with the Neoprene joints. This inspection showed that 4 joints had spalled a total of 2.5 feet. A second inspection, conducted in connection with the 1954 survey, revealed that one additional joint, located at Station 86+05, had developed a slight corner spall about 0.5 feet in length, at its east end. In all, 3.0 feet of spalling, representing 0.0044 percent of the total length of the 31 joints surveyed, occurred within the control section. During this same period, spalling occurred along 252.5 feet (38.2 percent) of the Neoprene joints.

The plans for Project F 31-15, C4 show that some of the Neoprene joints being reported are located over deep peat or muck pockets which had been filled by a special modified method of swamp evacuation. After completion of paving operations, settlement occurred over these areas to such an extent that it was finally necessary to mudjack them. This was done before the 1952 survey. Following the 1953 survey, these sections were patched with black top in order to bring them back to a smooth riding grade.

NEOPRENE JOINT NUMBER 16



▲ FIGURE 1. SHOWING DISINTEGRATION AS OF AUGUST 3, 1953. STATION 113+21. LOOKING WEST TO EAST.



▲ FIGURE 2. THE SAME JOINT, JUNE 9, 1954. SHOWING PROGRESSIVE CHECKING WHICH HAS OCCURRED SINCE 1953 SURVEY.

NEOPRENE JOINT NUMBER 19

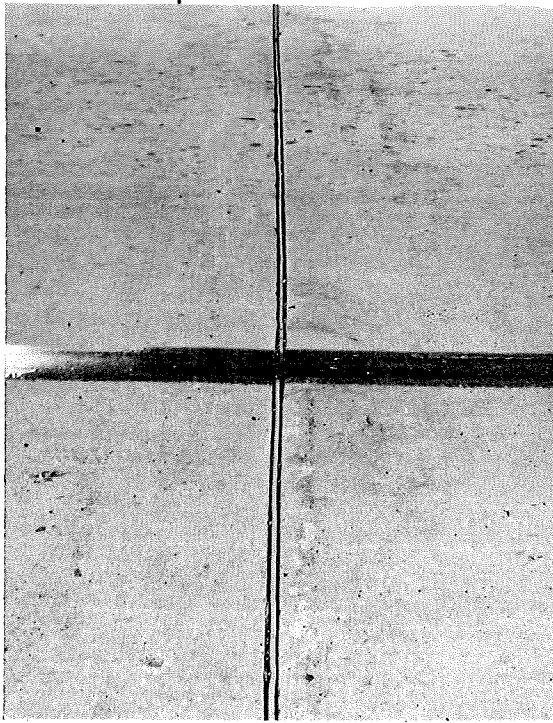


▲ FIGURE 3. SHOWING PAVEMENT CONDITION AS OF AUGUST 3, 1953. STATION 117+39. LOOKING EAST TO WEST.

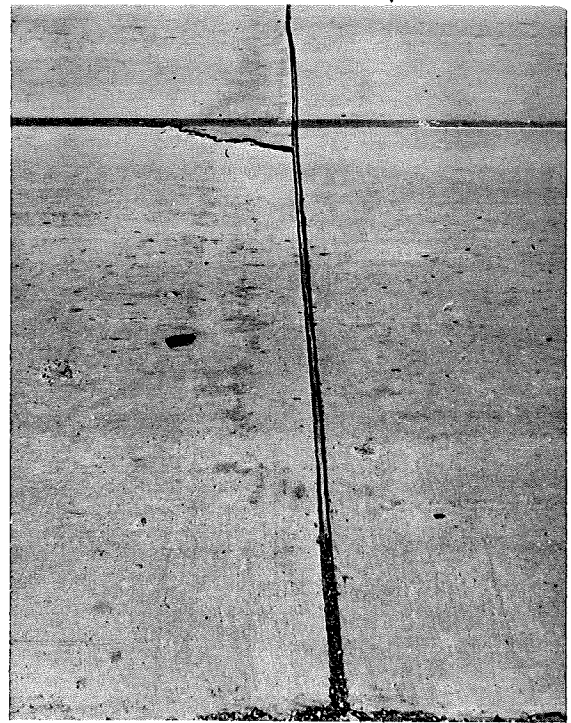


▲ FIGURE 4. THE SAME JOINT, JUNE 9, 1954. NOTE THE GREAT INCREASE IN DISINTEGRATION OF THE SLAB WHICH HAS TAKEN PLACE SINCE 1953 SURVEY.

NEOPRENE JOINT NUMBER 25

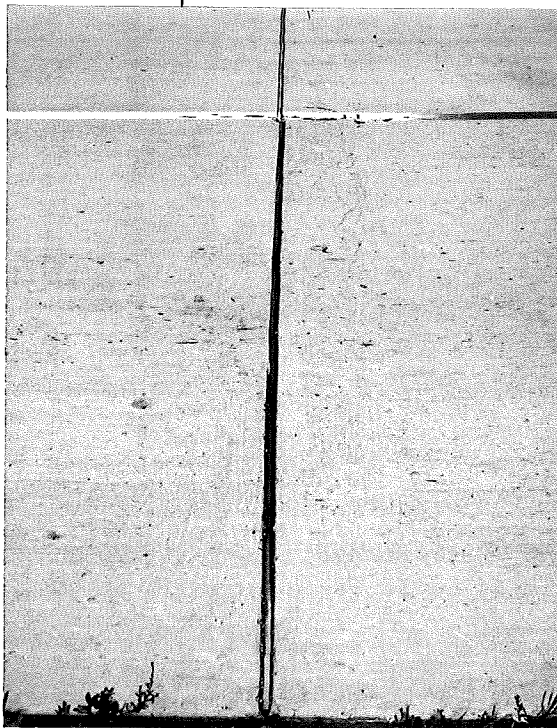


▲ FIGURE 5. SHOWING JOINT AS OF AUGUST 3, 1953. NOTE EXCELLENT CONDITION OF THE INSTALLATION AT THIS TIME. STATION 125+31. LOOKING WEST TO EAST.



▲ FIGURE 6. THE SAME JOINT, JUNE 9, 1954. SINCE THE 1953 SURVEY A BAD CORNER BREAK HAS DEVELOPED.

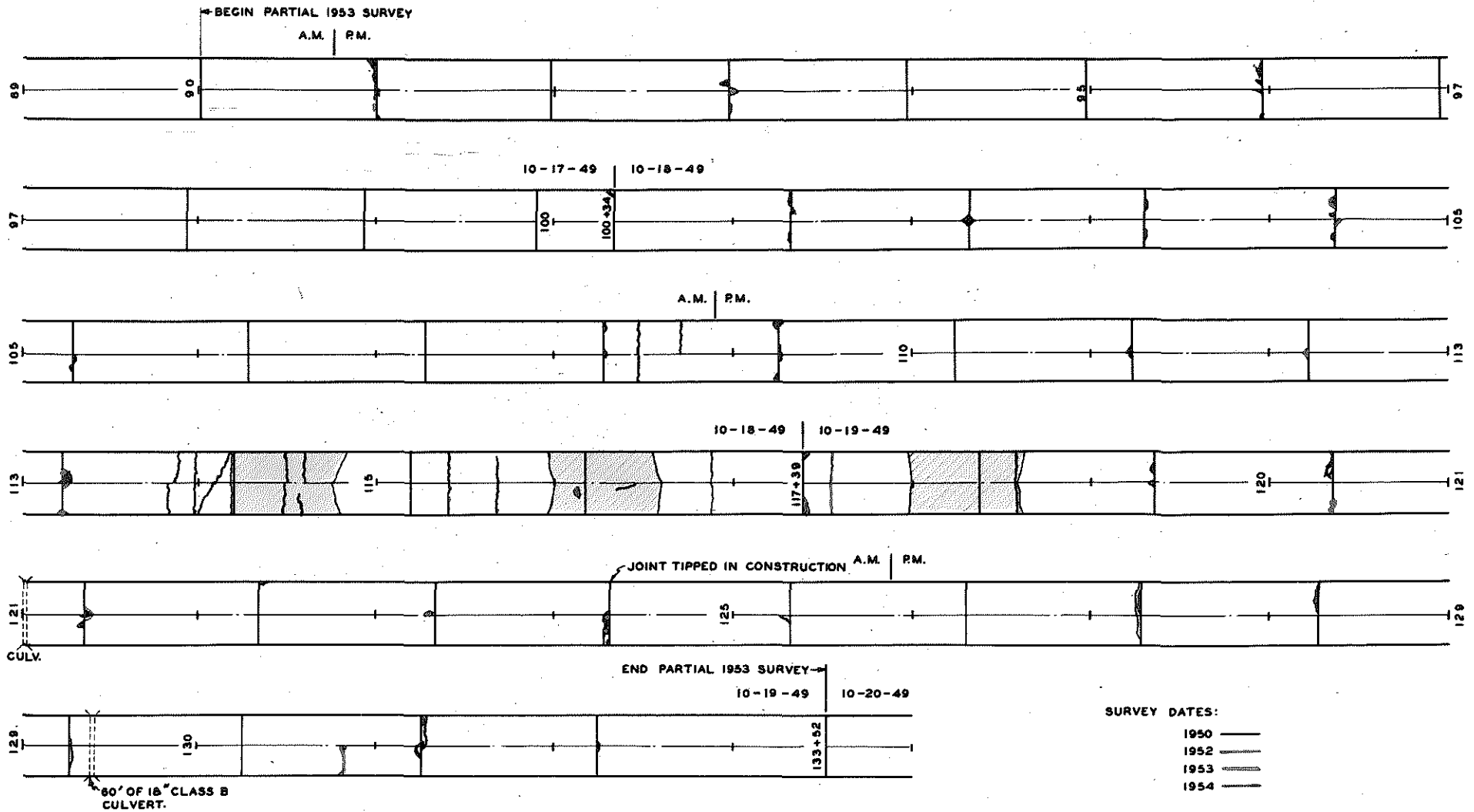
NEOPRENE JOINT NUMBER 28



▲ FIGURE 7. SHOWING JOINT AS OF AUGUST 3 1953, THIS JOINT DISPLAYS THE SAME AMOUNT OF CRACKING AS SHOWN IN THE 1952 SURVEY. STATION 129+27. LOOKING WEST TO EAST.



▲ FIGURE 8. THE SAME JOINT, JUNE 9, 1954. SHOWING ADDITIONAL SPALLING WHICH HAS TAKEN PLACE SINCE THE 1953 SURVEY.



CONDITION SURVEY OF NEOPRENE PREMOLDED JOINT SEAL INSTALLATION ON M-66
CONSTRUCTION PROJECT F 34-15, C4