OFFICE MEMORANDUM

DATE: April 28, 1976

TO: L. T. Oehler
Engineer of Research

FROM: W. K. Kruger

SUBJECT: Investigation of Straw Fire Damage to CRCP, I 96 Near Novi (I 63191-03586A).
Research Project 75 TI-294. Research Report No. R-997.

On July 26, 1975, a semi-trailer loaded with straw for covering seeded right-of-way on I 96 caught fire and burned. The local fire department had difficulty reaching the burning straw and by the time of their arrival the trailer had burned through, dropping burning straw on the pavement. They had also apparently tipped the trailer over, spilling the burning straw on the second lane. At the request of Construction Division personnel, representatives from the Research Laboratory visited the site on August 21, to assist in determining the extent of the fire damage to the pavement.

The damage was located on the two eastbound outer lanes of I 96, approximately 1-1/2 miles south of the junction of I 96 and I 696 near Novi. The pavement showed no spalling, but distinct craze cracking was apparent in the outside lane where the trailer had been parked; isolated areas of craze cracking were also present in the second lane. Surface condition features are shown in Figures 1 and 2.

A scale drawing of the fire area is shown in Figure 3. Ten spots were selected for Swiss Hammer readings; six were in the fire area, and four were in an undamaged area. Seven individual readings were taken at each spot and averaged, as shown in Table 1. Three spots, having an intermediate value average, were selected for coring in the fire area, and two in the control area.

The Swiss Hammer readings taken in the fire area generally produced higher values than the readings taken in the control area; this fact resulted because the fire dried and hardened the concrete surfaces. In addition, the rapid loss of moisture in the surface concrete produced shrinkage and caused the craze cracking in the fire area.

The five cores appeared in excellent shape with no pronounced cracks. They were tested in the Laboratory through 300 freeze-thaw cycles, in accordance with ASTM C 666-73 (Procedure B). After completing this test the cores showed no sign of the sort of disintegration that typically accompanies severe fire damage.

Since examination of the fire site revealed no spalling, Swiss Hammer tests indicated no strength loss, and the cores showed no disintegration in freeze-thaw, it is believed that the fire damage was slight; thus, no repair procedures are recommended.

TESTING AND RESEARCH DIVISION

William K. Kruger

Transportation Research Technician
Concrete and Surface Treatments

WKK:bf

Figure 1. General area view looking south along eastbound I 96 where straw-laden semi-trailer burned.

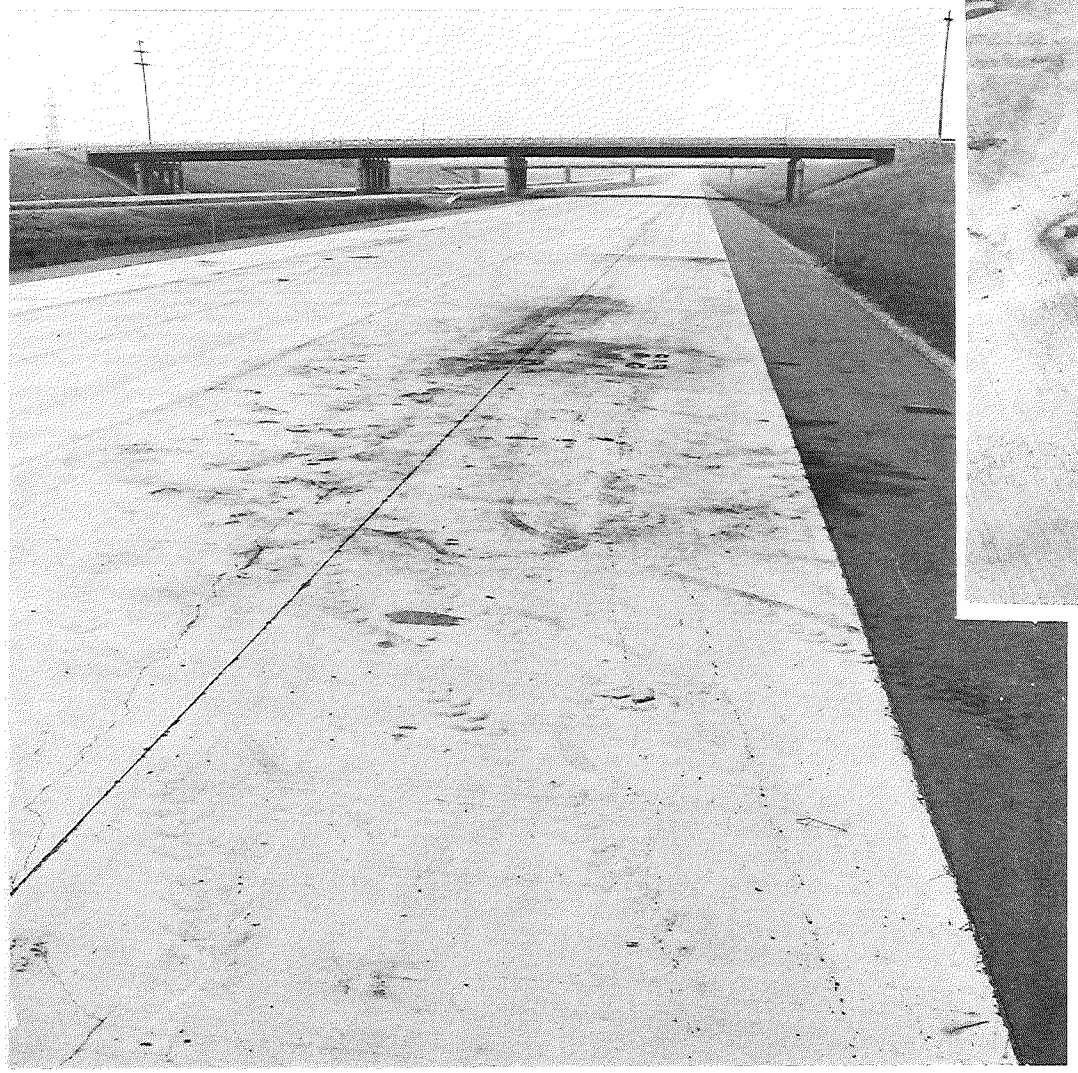

Figure 2. Close-up of Swiss Hammer test areas Nos. 1 and 6 and core C. Burned tire marks of trailer.

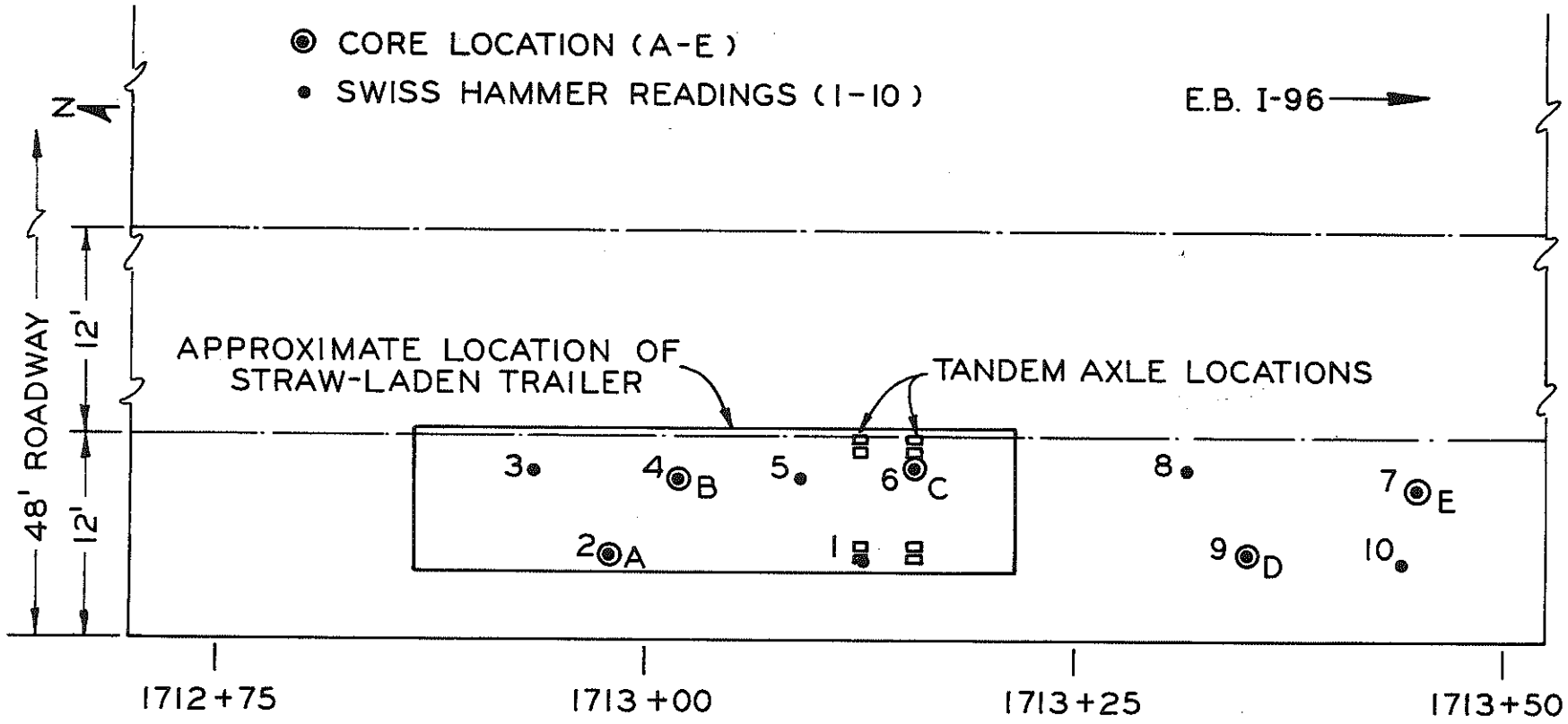

Figure 3. Location of fire damage, Swiss Hammer readings and coring sites on eastbound I 96.

TABLE 1
SUMMARY OF SWISS HAMMER TESTS
(EB I 96 Concrete Pavement - Outside Lane)

	Core Designation		Position	Swiss Hammer Readings							
	Field	Laboratory Number		1	2	3	4	5	6	7	Avg.
Fire Damaged Area			1	28	34	41	39	35	32	30	34
	A	75 CC 477	2	33	36	32	41	32	42	38	39
			3	44	39	44	39	42	43	33	41
	B	75 CC 478	4	35	37	33	36	38	42	38	37
			5	36	38	36	44	35	35	40	38
	C	75 CC 479	6	29	43	37	43	32	41	46	39
										Average of 6 areas =	38
Control Area	D	75 CC 481	7	35	36	32	31	39	34	33	34
			8	42	36	36	32	33	32	35	35
	E	75 CC 480	9	38	35	33	36	34	37	34	36
			10	28	34	29	28	27	35	42	32
										Average of 4 areas =	34