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ARIZONA'S PAVEMENT MANAGEMENT SYSTEM

PHASE II

FINAL TECHNICAL REPORT

ANALYSIS OF TESTING FREQUENCY FOR PAVEMENT EVALUATION

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16. Abstract

A Pavement Management System (PMS) is highly dependent on the quantity and quality of data. This report addresses the frequency of inventory tests (Deflection, rutting, cracking, flushing) necessary to insure appropriately sufficient quality of data. A designed experiment consisting of the above field tests were conducted at 76 two-mile locations, where 10 tests per mile (at .1 of a mile) were conducted. Results of that testing indicated that one dynaflect deflection rut depth, flushing index test and two percent cracking tests were adquate.

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PMS Data

A PMS is complex, and like all similar systems it is highly dependent on the quantity and quality of data. Over the years, ADOT has collected considerable data including ride roughness, percent cracking, skid numbers, Dynaflect deflection and rut depth. The quantity and quality of data has changed over time; as an example, initially inventory Dynaflect deflections were taken ten times a mile (one tenth mile intervals), this was reduced to three per mile and during the course of this project, eliminated. In 1973, a detailed distress survey including extent of cracking, width of crack, type of crack, flushing and rut depth was completed. The data was so voluminous and complicated no useful interpretation could be made of it. Subsequently, in 1977, a simplified percent cracking evaluation was adopted which developed a very useful number indicative of the extent and severity of cracking.

Presently, ADOT conducts an annual inventory for ride, percent cracking and skid number. The ride roughness inventory includes the roughness of every mile of highway within ADOT's system. Thus, the entire population of ride roughness values is compiled so there is no quantity problem, quality of data is checked to determine sensibility. In addition, the equipped vehicle is driven over the same mile of highway once a week to detect any instrument problems. Recently, NCHRP report #228 "Calibration of Response-Type Ride Roughness Measuring Systems" was used to implement a standardization method which uses calibrated bumps.

For percent cracking and skid number only a sample of the highways is taken during inventory. Initially in 1977, cracking values were obtained during the deflection inventory at one third mile intervals. The area

rated for percent cracking represented approximately 1,000 square feet, to be consistent with the AASHO road test (1). This area generally includes the twelve (12) foot travel or driving lane for a distance of about eighty (80) feet. In 1979, the deflection inventory was discontinued and a separate percent cracking inventory began. At present, the percent cracking is inventoried at each milepost (once a mile) instead of three times a mile. The area sampled is 1,000 square feet.

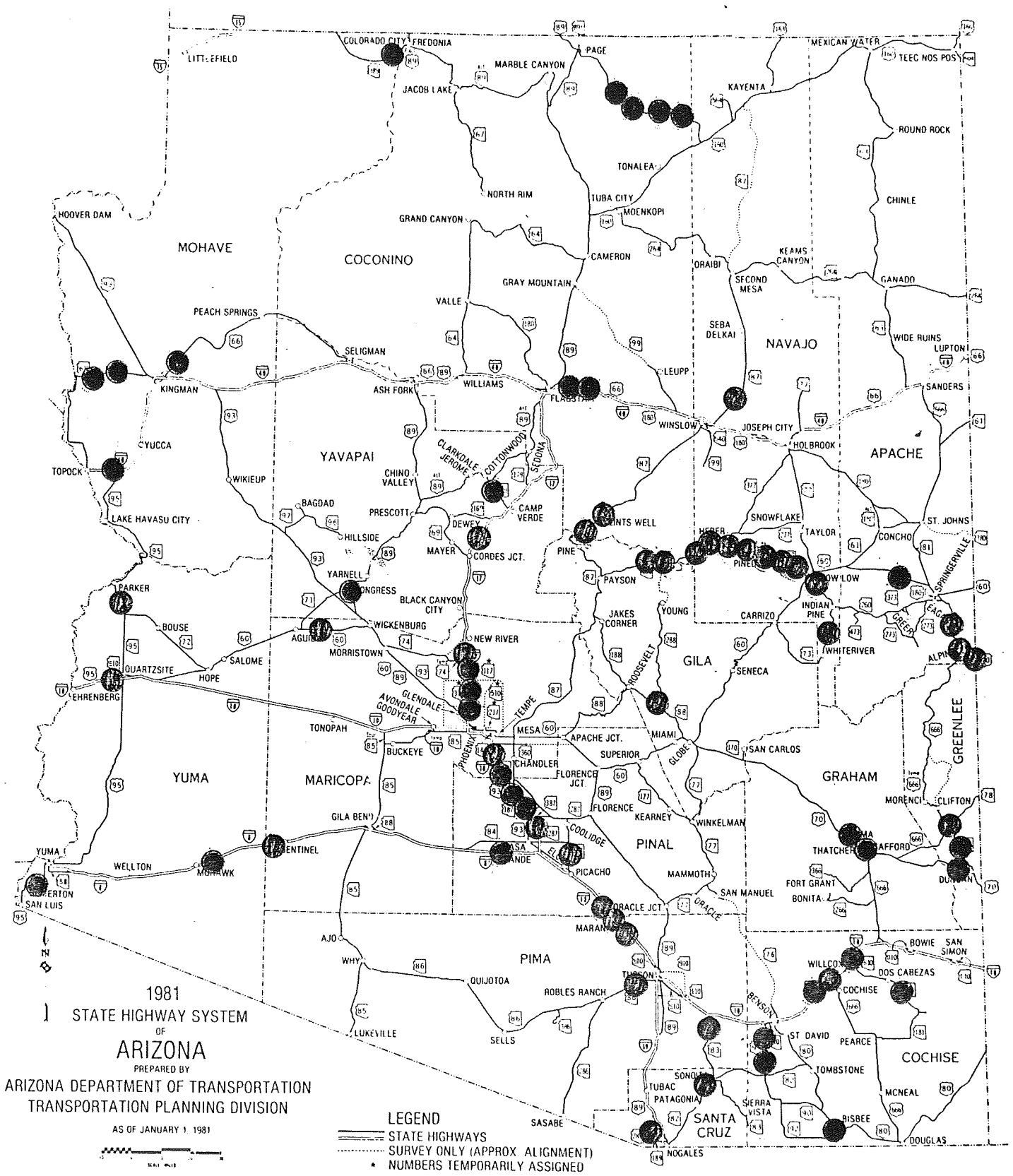
Skid number values are obtained with a Mu-Meter and several reports (2) (3) have documented ADOT's work with this device. Since the first inventory in 1972, measurements have been taken at the milepost, in the travel or driving lane left wheel path for a distance of 500 feet. Tests are performed at 40 miles per hour.

The ride roughness and cracking inventories are generally completed in about six months each. The skid inventory generally takes one year. Although Dynaflect deflections are no longer taken for inventory, they are still used for overlay design. Rutting and flushing have not been inventoried since 1973, however, recent rutting problems on a few projects have raised questions about rutting. The following section will examine a data gathering experiment directed toward characterizing the quantity and quality of inventory or design condition data.

Data Gathering Experiment

In order to study the role of data gathering, an experiment was designed, consisting of 76 two-mile locations. Figure A shows the location of all study sites. At each two-mile site ten dynaflect deflections, percent cracking, rut depth and flushing rating were conducted at one tenth mile intervals. The average and standard deviation of test results are shown in Appendix A, Table

FIGURE A TEST LOCATION



1A. This table shows values for 10,5,3 and 1 test. The values were logically sorted in the following fashion.

TESTS	LOCATION
10	At milepost and at one tenth mile intervals
5	At milepost and at .2, .4, .6, and .8 mile interval
3	At milepost and at .3 and .6 of a mile
1	At milepost

The logic behind this ordering was consistent with an annual inventory. The experiment was designed to determine how much difference could occur due to sample size changes. It is assumed that the ten readings per mile represented the standard or truth for this particular experiment.

Analysis of Test Results

Table 1 gives the average, pooled standard deviation and coefficient of variation for each type of test and each sample size. The size of the coefficients of variation are quite remarkable. The Dynaflect deflection was much smaller than anticipated whereas, the flushing index was very much smaller. To further illustrate what these numbers mean, Figures 1 through 12 give the relationships of the average of 5, 3 or 1 test to the average of ten tests per mile for Dynaflect deflection, rut depth, percent cracking and flushing index.

Results of this experiment conform to accepted statistical theory, as the number of samples was decreased the size of the standard deviation decreased by approximately one over the square root of N observations $(\frac{1}{\sqrt{n}})$

TABLE I

SUMMARY STATISTICS

AVERAGE

# OF TESTS/ MILE	N	DYNAFLECT DEFLECTION	RUT DEPTH	PERCENT CRACKING	FLUSHING INDEX
10	152	1.027	.219	3.93	4.78
5	152	1.022	.214	3.95	4.77
3	152	1.021	.219	3.81	4.78
1	152	.994	.223	3.83	4.80
		POOLED STANDARD DEVIATION OF GROUP			
10	152	.259	.093	3.19	.20
5	152	.249	.091	2.55	.19
3	152	.236	.086	2.14	.18
		COEFFICIENT OF VARIATION			
10	152	25	42	81	4
5	152	24	43	65	4
3	152	23	39	56	4

Table 2 gives a summary of the statistics shown on each figure. It would appear that one Dynaflect test per mile very closely approximates the average of ten tests per mile. For rut depth three tests per mile or even one test per mile give a good approximation of the ten test per mile average. Percent cracking values are the most variable of the group.

TABLE II

TEST DYNAFLECT DEFLECTION	N	A	B	R^2	STD. ERROR	COEFFICIENT OF VARIATION
X_{10} VS X_5	152	.0407	.951	.9026	.103	10%
X_{10} VS X_3	152	-.016	.998	.8515	.136	13
X_{10} VS X_1	152	.031	.932	.5722	.216	21
RUT DEPTH						
X_{10} VS X_5	152	.003	1.012	.8927	.039	18%
X_{10} VS X_3	152	.019	.916	.7936	.060	28
X_{10} VS X_1	152	.023	.467	.4286	.090	42
PERCENT CRACKING						
X_{10} VS X_5	152	-.097	1.033	.9321	1.745	44%
X_{10} VS X_3	152	-.156	.998	.7944	3.132	79
X_{10} VS X_1	152	2.225	1.129	.4460	4.655	118
FLUSHING						
X_{10} VS X_5	152	-.120	1.023	.9745	.094	2%
X_{10} VS X_3	152	.317	.935	.8553	.224	5
X_{10} VS X_1	152	.699	.859	.5756	.439	9

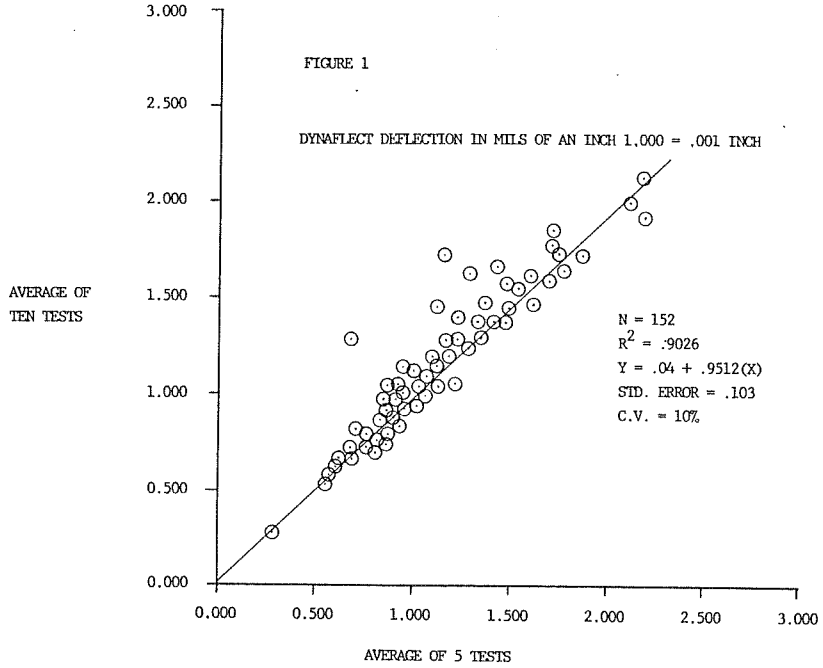


FIGURE 1
DYNAFLECT DEFLECTION IN MILS OF AN INCH 1.000 = .001 INCH
AVERAGE OF TEN TESTS
AVERAGE OF 5 TESTS
N = 152
R2 = .9026
Y = .04 + .9512(X)
STD. ERROR = .103
C.V. = 10%
0.000
0.500
1.000
1.500
2.000
2.500
3.000

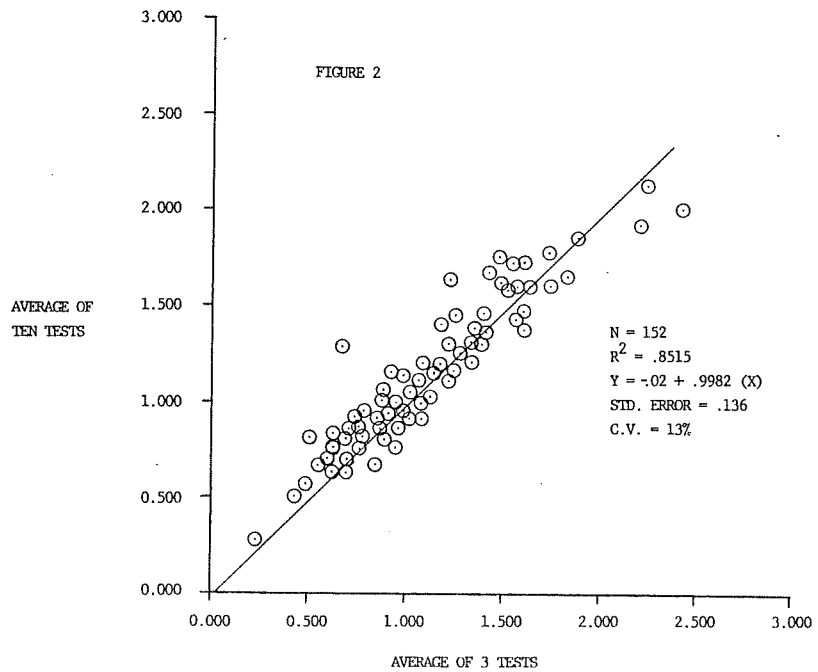


FIGURE 2
AVERAGE OF TEN TESTS
AVERAGE OF 3 TESTS
N = 152
R2 = .8515
Y = -.02 + .9982 (X)
STD. ERROR = .136
C.V. = 13%
0.000
0.500
1.000
1.500
2.000
2.500
3.000

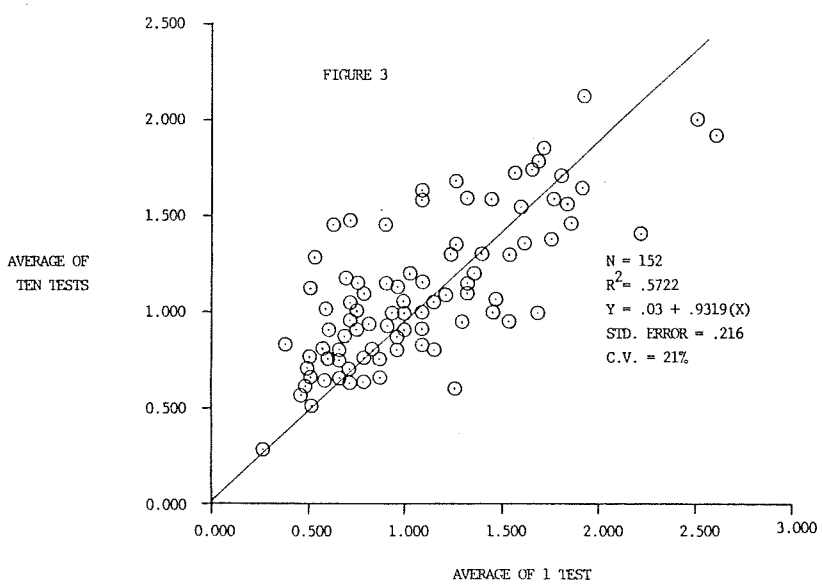


FIGURE 3
AVERAGE OF TEN TESTS
AVERAGE OF 1 TEST
N = 152
R2= .5722
Y = .03 + .9319(X)
STD. ERROR = .216
C.V. = 21%
0.000
0.500
1.000
1.500
2.000
2.500
3.000

FIGURE 4 RUT DEPTH IN INCHES

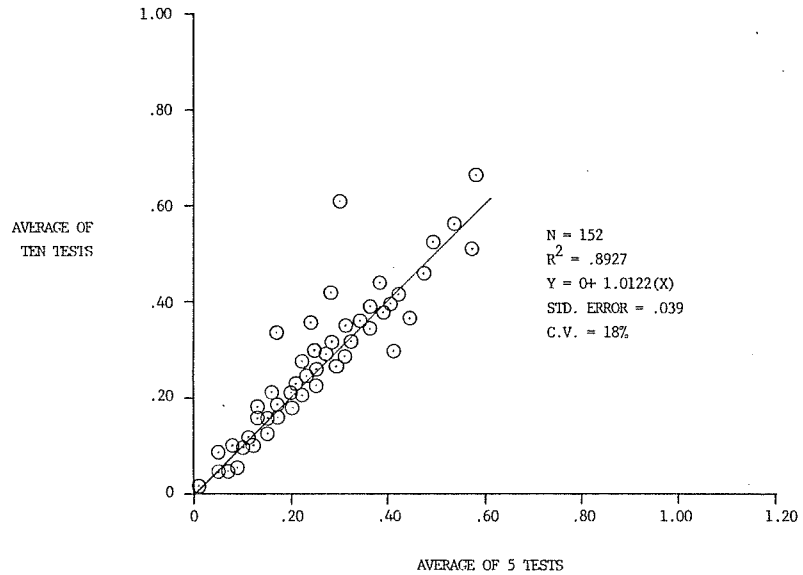


FIGURE 5

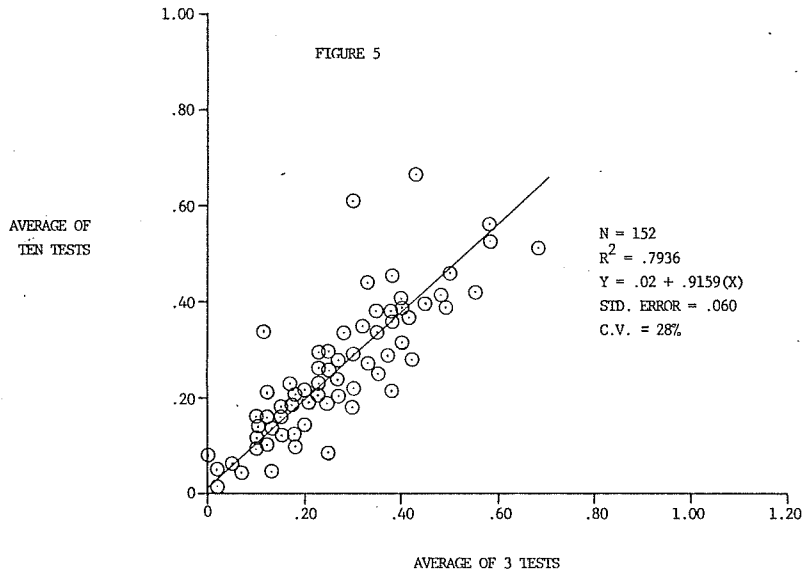


FIGURE 6

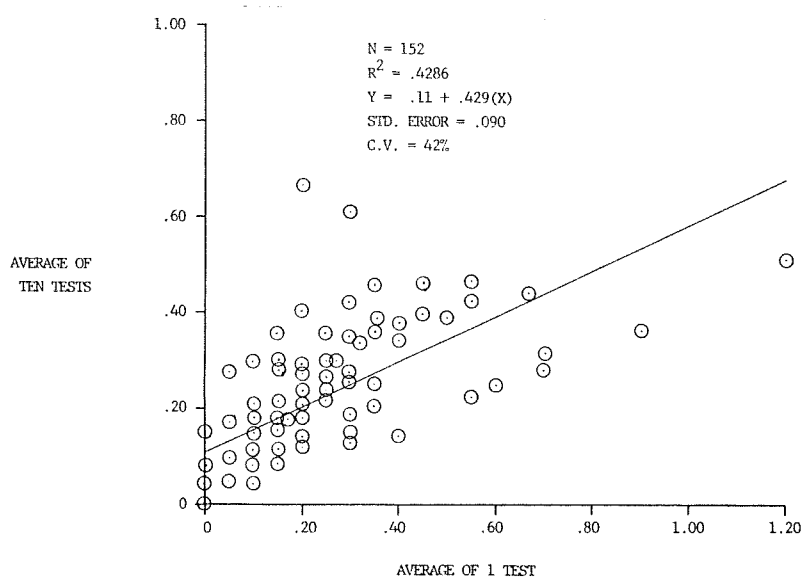


FIGURE 7 FLUSHING

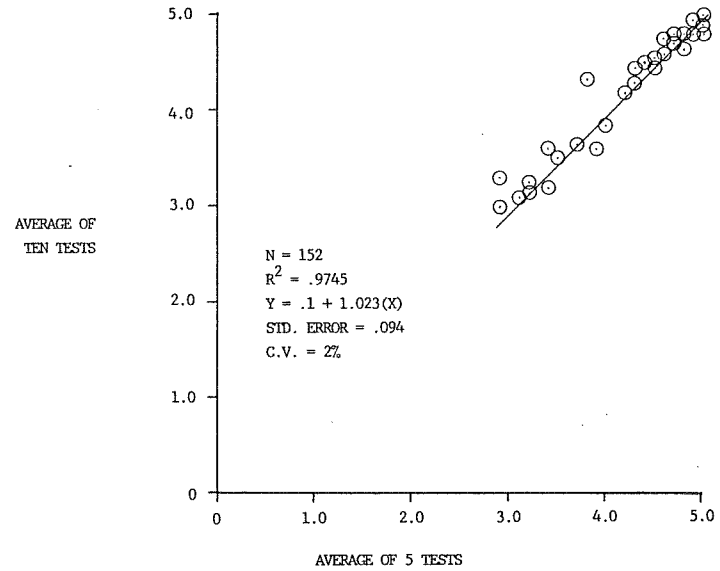


FIGURE 8

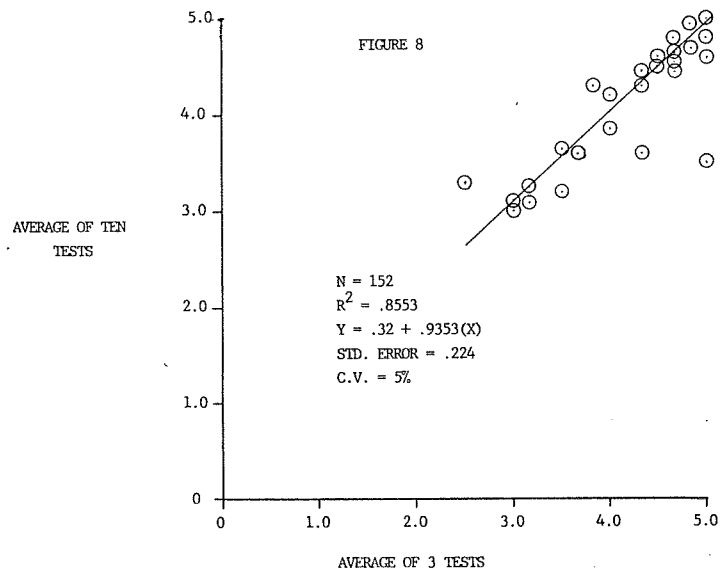


FIGURE 9

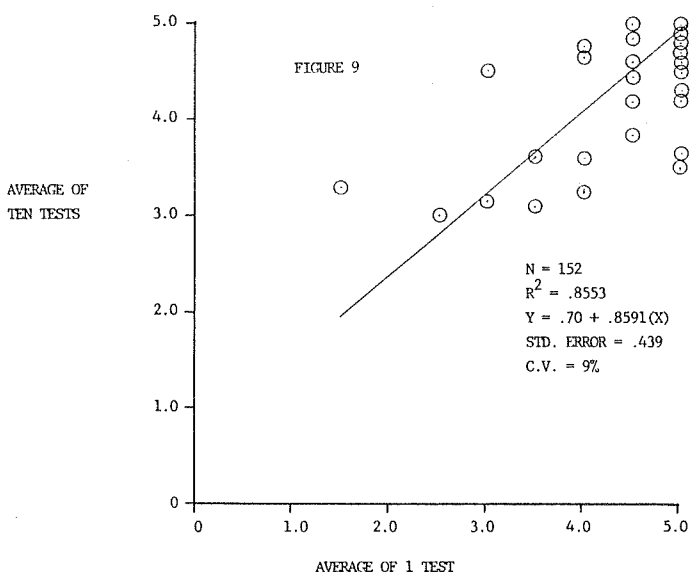


FIGURE 10 PERCENT CRACKING

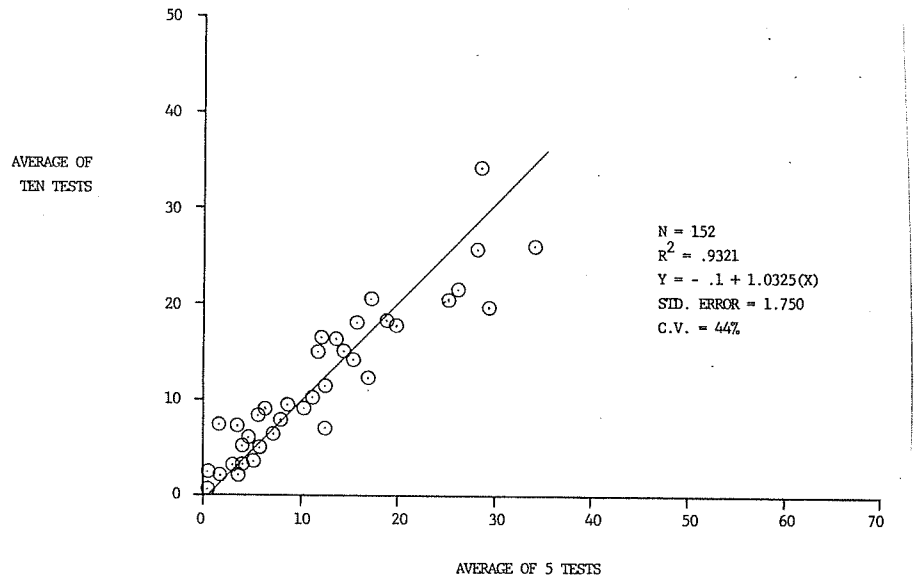


FIGURE 11 PERCENT CRACKING

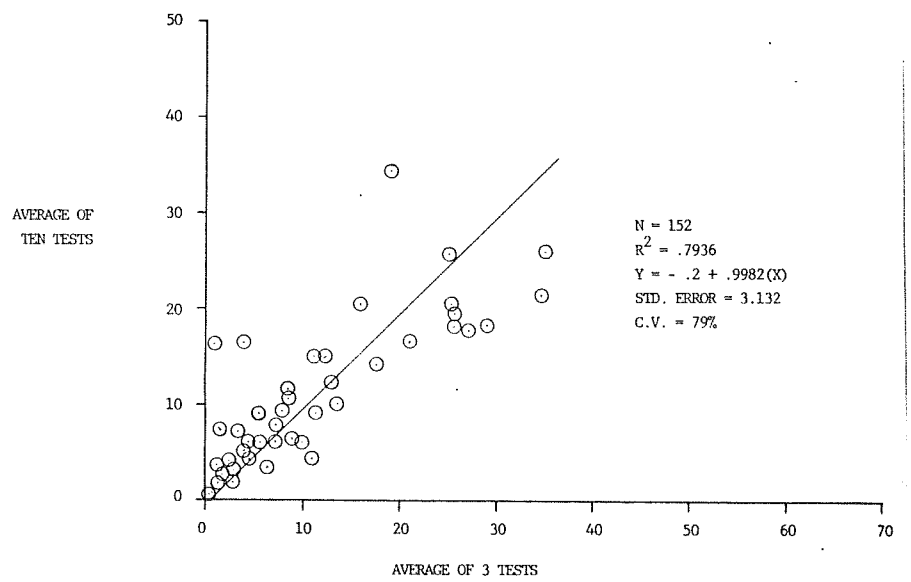


FIGURE 12 PERCENT CRACKING

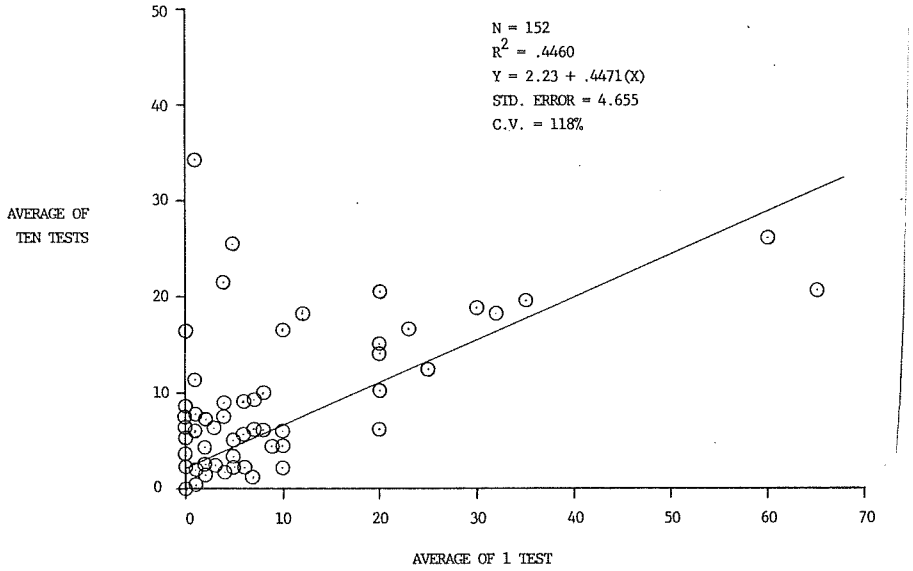
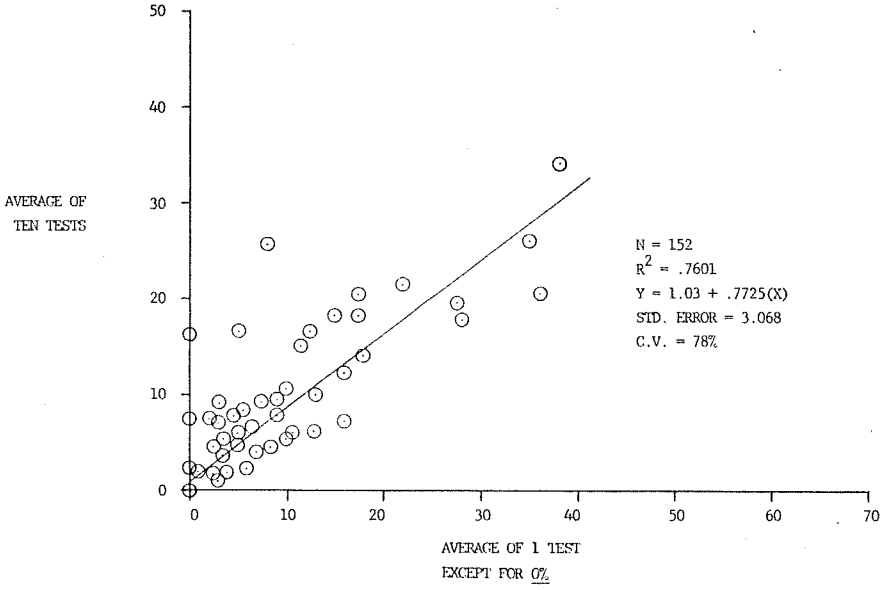


FIGURE 13 PERCENT CRACKING



Presently, one test per mile is used for inventory, primarily because it allows for a rapid review of all miles per year. Subsequent design reviews are much more intensive and generally represent ten tests per mile. In order to maintain the timeliness of the data a revised sampling scheme is suggested. Figure 13 shows that a stratified sample where one measurement is taken at the milepost if there is no cracking present, if any amount of cracking is observed (one percent or greater) an additional measurement is taken at the half mile location and averaged. In this way a much better relationahip between the sampled value and the average of ten measurements is derived. In fact, this stratified sample of no more than two measurements per mile is equivalent to three measurements per mile. The flushing index has the smallest coefficient of variation even for one test per mile, which is indicative of a rather uniform distribution of skid resistance over an entire mile. This would indicate that one Mu Meter test per mile is probably sufficient. A review of flushing index values vs Mu Meter number indicated a qualitative relationship. A total of 187 tests were matched at the milepost and the following was observed.

Flushing Index	# of Measurements	# of Mu Meter Tests 43 or Below	Percentage 43 or Below
5.0 - 3.0	181	3	1.7%
2.5 - 1.0	6	4	67%

This rough relationship would indicate that flushing index values of 2.5 or less are probably low Mu Meter number areas.

Discussion and Recommendations

It has been shown that the present data collection process is adequate except for percent cracking. It is recommended that the following frequency of data collection be implemented.

1). Dynaflect deflection one test per mile for design.

2). For inventory percent cracking,one test per mile if pavement uncracked, average of two tests per mile if milepost shows some percent cracking.

3). Mu Meter one test per mile for inventory. Flushing index could be used as an indicator of problems.

4). If rut depth were to be used for inventory purposes, one test per mile would be needed.

The additional percent cracking data will mean that an additional two months of inventory manpower will be needed per year. If rut depth were to become part of the inventory process at least eight man months of additional manpower would be needed.

This report has addressed the role that data collection plays in a pavement management process. In order to better understand the role that data collection plays in the entire system and to bring the reader up to date with ADOT's 1981 pavement managementsystem the following PMS overview section was developed.

References:

1. "The AASHO road test, report 5, Pavement Research," Highway Research Board Special Report 61E, 1962.

2. Burns, J.C. and R.J. Peters, "Surface Friction Study of Arizona Highways," Arizona Department of Transportation, January, 1973.

3. Burns, J.C., "Differential Friction Related to Skidding," Arizona Department of Transportation, April, 1975.

PART II

IMPLEMENTATION OF PMS

APPENDIX A

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR 73 N.B.	10	0.660	0.237	.185	.075	.000	.000	3.60	.843
M.R. 344-345	5	0.698	0.301	.170	.084	.000	.000	3.90	.224
	3	0.850	0.121	.167	.058	.000	.000	4.33	.289
	1	0.870	--	.100	--	.000	--	4.00	--
SR 73 N.B.	10	0.812	0.230	.205	.050	.000	.000	3.300	.753
M.P. 345-346	5	0.828	0.298	.220	.057	.000	.000	2.900	.822
	3	0.790	0.242	.233	.058	.000	.000	2.500	.867
	1	0.570	--	.300	--	.000	--	1.500	--
I-17 S.B.	10	1.631	0.675	.180	.095	7.400	8.669	4.800	.350
M.P. 265-266	5	1.296	0.666	.170	.067	1.600	2.302	4.900	.224
	3	1.230	0.167	.233	.058	1.666	1.528	4.667	.289
	1	1.080	--	.200	--	0.000	--	5.000	--
I-17 S.B.	10	1.722	0.606	.190	.070	6.100	7.370	4.450	.438
M.P. 266-267	5	1.156	0.781	.210	.055	6.000	8.944	4.300	.570
	3	1.550	0.555	.250	.087	10.000	10.000	4.67	.289
	1	1.560	--	.300	--	20.000	--	4.500	--
I-10 E.B.	10	0.912	0.246	.100	.113	2.300	2.751	5.000	.000
M.P. 17.8-18.7	5	0.960	0.294	.080	.084	2.600	3.782	5.000	.000
	3	0.740	0.125	.183	.144	.333	.577	5.000	.000
	1	0.840	--	.100	--	.000	--	5.000	--
I-10 B E.B.	10	0.809	.198	.080	.063	2.100	3.071	5.000	.000
M.P. 18.8-19.7	5	0.766	.268	.080	.084	1.867	2.615	5.000	.000
	3	0.667	.158	.000	--	.667	0.577	5.000	.000
	1	0.530	--	.000	--	1.000	--	5.000	--
I-17 S.B.	10	0.991	0.349	0.115	.047	7.200	9.852	5.000	.000
M.P. 226-227	5	1.068	0.309	0.110	.055	3.400	1.517	5.000	.000
	3	1.090	0.255	0.100	.000	2.333	2.517	5.000	.000
	1	1.080	--	0.100	--	2.000	--	5.000	--
I-17 S.B.	10	0.909	0.324	0.180	.195	21.500	24.140	5.000	.000
M.P. 227-228	5	0.864	0.156	0.200	.283	26.000	31.867	5.000	.000
	3	0.890	0.233	0.300	.346	34.667	40,067	5.000	.000
	1	1.080	--	0.100	--	4.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR - 87 N.B. M.P. 117-118	10	1.092	0.217	0.045	.076	7.300	7.646	5.000	.000
	5	1.074	0.217	0.050	.070	8.600	9.762	5.000	.000
	3	0.970	0.213	0.050	.087	3.667	3.055	5.000	.000
	1	0.780	--	0.000	--	1.000	--	5.000	--
SR 87 N.B. M.P. 118-119	10	1.374	0.254	0.085	.0944	9.000	11.614	5.000	.000
	5	1.410	0.277	0.050	.071	6.200	4.970	5.000	.000
	3	1.370	0.429	0.150	.150	5.667	3.786	5.000	.000
	1	1.740	--	0.150	--	4.000	--	5.000	.000
SR - 95 N.B. M.P. 138-139	10	0.826	0.202	0.105	.028	1.900	2.183	4.800	.258
	5	0.890	0.227	0.110	.022	1,800	2.490	4.800	.274
	3	0.803	0.280	0.100	.000	0.667	1.155	4.667	.289
	1	1.080	--	0.100	--	2.000	--	5.000	--
SR 95 N.B. M.P. 139-140	10	0.633	0.131	0.105	.016	0.700	1.337	4.900	.316
	5	0.676	0.083	0.110	.022	0.400	0.894	5.000	.000
	3	0.710	0.096	0.117	.029	1.333	2.309	5.000	.000
	1	0.780	--	0.150	--	0.000	--	5.000	--
SR 88 EB M.P. 255-256	10	1.044	.284	.015	.024	.000	.000	5.000	.000
	5	1.026	.237	.010	.022	.000	.000	5.000	.000
	3	1.040	.367	.017	.029	.000	.000	5.000	.000
	1	.720	--	.000	--	.000	--	5.000	.000
SR 88 E.B. M.P. 256-257	10	1.046	.347	.045	.096	.000	.000	5.000	.000
	5	1.218	.346	.070	.130	.000	.000	5.000	.000
	3	.970	.121	.133	.153	.000	.000	5.000	.000
	1	1.08	--	.000	--	.000	--	5.000	--
S.R. 666 N.B. M.P. 155-156	10	.868	.255	.000	.000	.500	.527	5.000	.000
	5	.848	.311	.000	.000	.400	.548	5.000	.000
	3	.970	.302	.000	.000	.333	.577	5.000	.000
	1	.690	--	.000	--	.000	--	5.000	.000
S.R. 666 N.B. M.P. 156-157	10	.883	.324	.000	.000	.400	.516	5.000	.000
	5	.846	.349	.000	.000	.400	.548	5.000	.000
	3	.940	.225	.000	.000	.333	.577	5.000	.000
	1	.720	--	.000	.000	1.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
I-8 E.B. M.P. 82-83	10	0.990	0.341	0.120	.048	14.100	5.705	5.000	.000
	5	1.020	0.430	0.120	.045	15.200	5.070	5.000	.000
	3	1.140	0.468	0.150	.050	17.667	4.041	5.000	.000
	1	1.680	--	0.200	--	20.000	--	5.000	--
I-8 E.B. M.P. 83-84	10	0.858	0.183	0.160	.088	25.700	17.302	5.000	.000
	5	0.810	0.120	0.170	.097	28.000	19.235	5.000	.000
	3	1.000	0.183	0.150	.087	25.000	20.000	5.000	.000
	1	0.840	--	0.100	--	5.000	--	5.000	--
US 60 E.B. M.P. 89-90	10	1.722	.329	0.045	.044	20.500	22.506	5.000	.000
	5	1.866	.135	0.050	.050	25.000	24.759	5.000	.000
	3	1.610	.410	0.067	.058	25.333	34.385	5.000	.000
	1	1.800	--	0.100	--	65.000	--	5.000	--
US 60 E.B. M.P. 90-91	10	1.848	0.209	0.050	0.041	17.900	13.076	5.000	.000
	5	1.716	0.161	0.060	0.042	19.600	17.757	5.000	.000
	3	1.880	0.294	0.050	0.041	27.000	19.672	5.000	.000
	1	1.710	--	0.050	--	30.000	--	5.000	--
I-10 E.B. M.P. 332-333	10	1.472	.748	.125	.049	7.000	11.005	5.000	.000
	5	1.368	.497	.150	.05	12.400	14.010	5.000	.000
	3	1.240	.750	.117	.076	2.667	2.082	5.000	.000
	1	0.720	--	.100	--	2.000	--	4.500	.000
I-10 E.B. M.P. 333-334	10	1.773	.316	.110	.039	16.300	23.810	4.950	.158
	5	1.722	.234	.110	.055	13,600	28.762	4.900	.224
	3	1.740	.060	.117	.029	1.000	1.732	4.833	.289
	1	1.680	--	.100	--	0.000	--	5.000	--
S.R. 86 E.B. M.P. 163-164	10	0.796	0.239	0.210	.057	0.000	0.000	5.000	0.000
	5	0.792	0.137	0.200	.061	0.000	0.000	5.000	0.000
	3	0.900	0.317	0.217	.076	0.000	0.000	5.000	0.000
	1	0.660	--	0.300	--	0.000	--	5.000	--
S.R. 87 N.B. MP 351-352	10	1.644	0.229	0.225	0.118	12.300	10.822	5.000	0.000
	5	1,782	0.164	0.250	0.170	16.800	14.394	5.000	0.000
	3	1.830	0.079	0.300	0.218	13.000	10.583	5.000	0.000
	1	1.920	--	0.550	--	25.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR 87 N.B.	10	1.587	0.362	0.210	.039	9.100	4.932	5.000	0.000
M.P. 353-354	5	1.704	0.318	0.190	.022	10.200	6.943	5.000	0.000
	3	1.750	0.035	0.217	.076	11.333	7.572	5.000	0.000
	1	1.770	--	0.200	--	6.000	--	5.000	--
SR 87 N.B.	10	1.150	0.224	0.210	.137	0.200	.422	5.000	0.000
MP 288-289	5	1.118	0.256	0.160	.065	0.200	.447	5.000	0.000
	3	1.250	0.200	0.117	.029	0.333	.577	5.000	0.000
	1	1.080	--	0.100	--	0.000	--	5.000	--
SR 87 N.B.	10	0.999	0.245	.195	.107	.700	2.213	5.000	.000
MP 283-284	5	1.056	0.217	.230	.135	.000	.000	5.000	.000
	3	0.877	0.282	.183	.076	.000	.000	5.000	.000
	1	0.750	--	.200	--	.000	--	5.000	.000
SR 87 N.B.	10	1.191	.260	.275	.172	2.000	3.496	5.000	.000
M.P. 276-277	5	1.098	.224	.220	.110	.000	.000	5.000	.000
	3	1.090	.262	.333	.333	3.000	5.196	5.000	.000
	1	1.020	--	.050	--	.000	--	5.000	.000
SR 82 E.B.	10	1.146	0.262	0.215	0.135	16.500	21.146	5.000	.000
MP 25-26	5	1.026	0.337	.190	.089	12.000	18.802	5.000	.000
	3	0.930	0.286	.183	.104	4.000	5.292	5.000	.000
	1	0.900	--	.300	--	10.000	--	5.000	--
SR 83 N.B.	10	1.203	.339	.095	.016	.000	.000	5.000	.000
MP 56-57	5	1.194	.243	.100	.000	.000	.000	5.000	.000
	3	1.340	.017	.100	.000	.000	.000	5.000	.000
	1	1.350	--	.100	--	.000	--	5.000	.000
SR 83 N.B.	10	1.290	.158	.135	.041	.000	.000	5.000	.000
MP 57 - 58	5	1.230	.141	.140	.042	.000	.000	5.000	.000
	3	1.350	.159	.133	.029	.000	.000	5.000	.000
	1	1.230	--	.100	--	.000	--	5.000	--
SR 260 E.B.	10	.705	.216	.255	.064	.100	.316	4.900	.211
MP 291-292	5	.764	.299	.250	.035	.200	.447	4.900	.224
	3	.860	.346	.250	.050	.333	.577	4.833	.289
	1	1.260	--	.300	--	1.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR 260 E.B.	10	0.810	0.208	0.265	0.075	0.000	0.000	4.650	0.669
MP 295-296	5	0.780	0.170	0.290	0.074	0.000	0.000	4.800	0.447
	3	0.700	0.035	0.267	0.029	0.000	0.000	4.667	0.577
	1	0.660	--	0.250	--	0.000	--	4.000	--
SR 260 E.B.	10	0.702	0.020	0.210	0.052	0.000	0.000	5.000	0.000
M.P. 294-295	5	0.808	0.021	0.210	0.065	0.000	0.000	5.000	0.000
	3	0.607	0.099	0.217	0.076	0.000	0.000	5.000	0.000
	1	0.720	--	0.200	--	0.000	--	5.000	
SR 86 E.B.	10	0.822	0.123	0.235	.063	0.000	0.000	5.000	0.000
MP 165-166	5	0.828	0.149	0.250	.035	0.000	0.000	5.000	0.000
	3	0.840	--	0.233	.029	0.000	0.000	5.000	0.000
	1	0.840	--	0.250	--	0.000	--	5.000	--
U.S. 180 E.B.	10	2.006	0.489	0.215	0.034	0.000	0.000	3.100	0.394
M.P. 412-413	5	2.122	0.386	0.200	0.035	0.000	0.000	3.100	0.418
	3	2.433	0.058	0.200	0.050	0.000	0.000	3.167	0.577
	1	2.500	--	0.150	--	0.000	--	3.500	--
U.S. 180 E.B.	10	2.129	0.313	0.270	0.063	0.000	0.000	3.850	0.530
M.P. 414-415	5	2.186	0.356	0.230	0.045	0.000	0.000	4.000	0.500
	3	2.240	0.295	0.250	0.050	0.000	0.000	4.000	0.500
	1	1.920	--	0.200	--	0.000	--	4.500	--
SR 260 E.B.	10	0.987	0.138	0.235	0.047	0.000	0.000	5.000	0.000
M.P. 297-298	5	1.008	0.166	0.240	0.042	0.000	0.000	5.000	0.000
	3	1.010	0.151	0.250	0.050	0.000	0.000	5.000	0.000
	1	0.990	--	0.200	0.000	0.000	--	5.000	--
SR 260 E.B.	10	.755	.208	.245	.055	.200	.422	4.950	.158
M.P. 290-291	5	.760	.241	.230	.027	.400	.548	4.900	.224
	3	.627	.055	.233	.029	.000	.000	4.833	.289
	1	.600	--	.200	--	.000	--	4.500	--
SR 260 E.B.	10	.816	.133	.215	.100	.000	.000	4.760	.425
M.P. 298-299	5	.732	.115	.210	.042	.000	.000	4.600	.548
	3	.860	.105	.283	.153	.000	.000	4.667	.577
	1	.870	--	.250	--	.000	--	4.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
US 180 E.B. M.P. 427-428	10	0.900	0.224	0.215	0.053	0.000	0.000	4.600	0.211
	5	0.834	0.217	0.210	0.065	0.000	0.000	4.600	0.224
	3	0.740	0.035	0.167	0.029	0.000	0.000	4.500	0.000
	1	0.720	--	0.150	--	0.000	--	4.500	--
US 180 E.B. M.P. 423-424	10	1.277	1.943	0.180	0.042	0.000	0.000	3.000	0.408
	5	0.676	0.088	0.180	0.048	0.000	0.000	2.900	0.418
	3	0.687	0.143	0.150	0.050	0.000	0.000	3.000	0.500
	1	0.530	--	0.200	--	0.000	--	2.500	--
US 180 E.B. M.P. 430-431	10	0.744	0.099	0.270	0.042	0.000	0.000	3.250	1.006
	5	0.862	0.474	0.270	0.027	0.000	0.000	3.200	1.036
	3	0.670	0.045	0.250	0.050	0.000	0.000	3.166	1.443
	1	0.666	--	0.300	--	0.000	--	4.000	--
US 180 E.B. M.P. 431-432	10	0.694	0.184	0.250	0.052	0.000	0.000	3.200	0.632
	5	0.766	0.183	0.230	0.044	0.000	0.000	3.400	0.821
	3	0.743	0.285	0.250	0.086	0.000	0.000	3.500	0.500
	1	0.660	--	0.200	--	0.000	--	4.000	--
I-10 W.B. M.P. 237-238	10	1.092	0.081	0.255	0.126	0.000	0.000	4.650	0.242
	5	1.122	0.101	0.300	0.173	0.000	0.000	4.600	0.224
	3	1.030	0.035	0.350	0.218	0.000	0.000	4.667	0.289
	1	0.990	--	0.600	--	0.000	--	4.500	--
I-10 W.B. M.P. 232-233	10	0.846	0.116	0.290	0.102	0.000	0.000	4.700	0.422
	5	0.849	0.149	0.270	0.067	0.000	0.000	4.800	0.274
	3	0.800	0.755	0.267	0.076	0.000	0.000	4.833	0.289
	1	0.870	--	0.200	--	0.000	--	5.000	--
I-10 W.B. M.P. 235-236	10	0.946	0.282	0.175	0.063	0.000	0.000	4.555	0.437
	5	0.972	0.242	0.190	0.074	0.000	0.000	4.500	0.500
	3	0.783	0.359	0.183	0.104	0.000	0.000	4.500	0.500
	1	0.720	--	0.300	--	0.000	--	4.500	--
I-10 E.B. M.P. 237-238	10	0.779	0.142	0.155	0.076	0.000	0.000	5.000	0.000
	5	0.766	0.199	0.150	0.100	0.000	0.000	5.000	0.000
	3	0.676	0.155	0.150	0.132	0.000	0.000	5.000	0.000
	1	0.530	--	0.300	--	0.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
I-10 W.B. M.P. 240-241	10	0.894	0.124	0.120	0.034	0.000	0.000	5.000	0.000
	5	0.864	0.106	0.120	0.273	0.000	0.000	5.000	0.000
	3	0.940	0.062	0.116	0.028	0.000	0.000	5.000	0.000
	1	0.990	--	0.100	--	0.000	--	5.000	--
SR 260 E.B. M.P. 320-321	10	0.809	0.124	0.390	0.061	0.000	0.000	5.000	0.000
	5	0.810	0.137	0.360	0.065	0.000	0.000	5.000	0.000
	3	0.796	0.225	0.400	0.050	0.000	0.000	5.000	0.000
	1	1.050	--	0.356	--	0.000	0.000	5.000	--
SR 260 E.B. M.P. 272-273	10	1.140	0.348	0.255	0.064	0.000	0.000	4.850	0.241
	5	0.948	0.163	0.240	0.054	0.000	0.000	4.900	0.223
	3	1.150	0.499	0.250	0.050	0.000	0.000	4.666	0.288
	1	0,750	--	0.200	--	0.000	--	4.500	--
SR 260 E.B. M.P. 273.14-274	10	0.933	0.160	0.420	0.228	5.200	7.330	4.200	0.674
	5	0.924	0.206	0.280	0.135	4.000	8.944	4.200	0.908
	3	0.920	0.113	0.550	0.312	5.000	8.660	4.666	0.577
	1	0.870	--	0.300	--	0.000	--	5.000	--
SR 260 E.B. M.P. 270-271	10	0.915	0.211	0.230	0.100	0.400	1.264	4.500	0.235
	5	0.918	0.169	0.210	0.041	0.000	0.000	4.500	0.353
	3	0.866	0.155	0.166	0.076	1.333	2.309	4.600	0.288
	1	0.710	--	0.150	--	0.000	--	5.000	--
SR 260 E.B. M.P. 271-272	10	0.869	0.133	0.175	0.058	0.000	0.000	4.550	0.368
	5	0.880	0.155	0.170	0.044	0.000	0.000	4.500	0.353
	3	0.766	0.174	0.166	0.057	0.000	0.000	4.500	0.500
	1	0.960	--	0.200	--	0.000	--	4.500	--
SR 260 E.B. M.P. 277-278	10	0.740	0.169	0.365	0.227	6.000	8.432	3.650	0.668
	5	0.714	0.142	0.440	0.295	6.000	8.944	3.700	0.908
	3	0.783	0.260	0.416	0.419	10.000	10.000	3.500	1.322
	1	0.680	--	0.900	--	10.000	--	5.000	--
SR 260 E.B. M.P. 278-279	10	1.048	0.279	0.315	0.182	0.500	0.849	3.600	0.737
	5	0.918	0.040	0.280	0.248	0.800	1.095	3.400	0.961
	3	0.888	0.115	0.400	0.264	0.666	1.154	3.666	0.763
	1	0.990	--	0.700	--	0.000	--	3.500	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
I-10 E.B.	10	1.299	.264	.395	.080	3.500	3.894	4.300	.258
M.P. 194-195	5	1.350	.292	.400	.079	5.200	4.764	4.300	.274
	3	1.400	.225	.450	.050	6.667	2.887	4.333	.289
	1	1.530	--	.450	--	5.000	--	4.000	--
SR 260 E.B.	10	1.124	.457	.405	.140	1.400	1.955	3.150	.242
M.P. 346-347	5	1.080	.485	.410	.188	1.200	1.304	3.200	.274
	3	.990	.417	.400	.200	2.333	3.215	3.167	.289
	1	.510	--	.200	--	.000	--	3.000	--
SR 260 E.B.	10	0.932	0.305	0.260	0.084	0.500	1.581	5.000	0.000
M.P. 327-328	5	0.978	0.268	0.240	0.065	1.000	2.236	5.000	0.000
	3	0.990	0.266	0.233	0.057	0.000	0.000	5.000	0.000
	1	0.690	--	0.200	--	0.000	--	5.000	--
SR 260 E.B.	10	0.937	0.305	0.285	0.666	0.000	0.000	3.100	0.516
M.P. 336-337	5	1.014	0.397	0.310	0.074	0.000	0.000	3.100	3.100
	3	0.890	0.357	0.300	0.100	0.000	0.000	3.000	0.000
	1	1.290	--	0.200	--	0.000	--	3.000	--
SR 260 E.B.	10	0.930	0.137	0.460	0.104	0.000	0.000	5.000	0.000
M.P. 329-330	5	0.936	0.191	0.470	0.135	0.000	0.000	5.000	0.000
	3	0.910	0.686	0.500	0.180	0.000	0.000	5.000	0.000
	1	0.810	--	0.450	--	0.000	--	5.000	--
SR 260	10	1.173	0.243	0.180	0.034	3.200	2.090	5.000	0.000
M.P. 331-332	5	1.152	0.254	0.190	0.022	3.000	2.345	5.000	0.000
	3	1.170	0.432	0.166	0.057	3.000	2.000	5.000	0.000
	1	1.050	--	0.200	--	5.000	--	5.000	--
SR 260 E.B.	10	1.194	0.234	0.375	0.058	1.800	2.440	5.000	0.000
M.P. 322-323	5	1.176	0.192	0.390	0.054	1.400	1.949	5.000	0.000
	3	1.160	0.221	0.416	0.028	1.333	2.309	5.000	0.000
	1	0.990	--	0.400	--	0.000	--	5.000	--
SR 260 E.B.	10	0.970	0.205	0.355	0.072	1.000	1.563	5.000	0.000
M.P. 324-325	5	0.984	0.189	0.340	0.089	0.800	0.837	5.000	0.000
	3	0.920	0.225	0.283	0.058	0.333	0.577	5.000	0.000
	1	1.050	--	0.250	--	1.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR 260 E.B.	10	0.619	0.103	0.380	0.063	0.000	0.000	5.000	0.000
M.P. 321-322	5	0.598	0.092	0.360	0.065	0.000	0.000	5.000	0.000
	3	0.487	0.031	0.383	0.029	0.000	0.000	5.000	0.000
	1	0.480	--	0.400	--	0.000	--	5.000	--
SR 260 E.B.	10	1.047	0.181	0.255	0.050	2.200	2.394	5.000	0.000
M.P. 319-320	5	0.990	0.220	0.250	0.061	1.800	2.287	5.000	0.000
	3	1.070	0.171	0.233	0.029	1.333	0.577	5.000	0.000
	1	0.930	--	0.200	0.000	1.000	--	5.000	--
SR 260 E.B.	10	0.765	0.235	0.215	0.047	0.800	1.476	5.000	0.000
M.P. 318-319	5	0.810	0.329	0.230	0.045	1.400	1.949	5.000	0.000
	3	0.690	0.180	0.200	0.000	0.000	0.000	5.000	0.000
	1	0.510	--	0.200	--	0.000	--	5.000	--
SR 260 E.B.	10	0.796	0.153	0.235	0.047	1.900	2.685	4.450	0.926
M.P. 317-318	5	0.864	0.169	0.250	0.061	1.200	1.789	4.500	0.866
	3	0.793	0.232	0.233	0.029	2.000	2.000	4.333	1.155
	1	1.050	--	0.250	--	4.000	--	5.000	--
SR 260 E.B.	10	0.987	0.163	0.265	0.053	0.000	0.000	5.000	0.000
M.P. 325-326	5	0.948	0.186	0.260	0.042	0.000	0.000	5.000	0.000
	3	0.960	0.079	0.267	0.053	0.000	0.000	5.000	0.000
	1	0.990	--	0.300	--	0.000	--	5.000	--
I-10 E.B.	10	1.056	.099	.085	.034	.000	.000	5.000	.000
M.P. 159-160	5	1.086	.109	.080	.045	.000	.000	5.000	.000
	3	1.070	.075	.100	.000	.000	.000	5.000	.000
	1	1.080	--	.100	--	.000	--	5.000	--
I-10 W.B.	10	.843	.092	.105	.016	.000	.000	5.000	.000
M.P. 160-159	5	.894	.091	.100	.000	.000	.000	5.000	.000
	3	.850	.105	.100	.000	.000	.000	5.000	.000
	1	.840	--	.100	--	.000	--	5.000	.000
I 10 E.B.	10	.989	.140	.205	.064	2.300	1.703	5.000	.000
M.P. 162-163	5	.966	.068	.230	.076	3.000	2.121	5.000	.000
	3	1.010	.114	.267	.058	3.333	1.528	5.000	.000
	1	.930	--	.300	--	5.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR 289 W.B. M.P. 5-6	10	1.921	1.127	.295	.231	.400	.516	5.000	.000
	5	2.188	1.392	.410	.284	.400	.548	5.000	.000
	3	2.217	0.479	.250	.050	.333	.577	5.000	.000
	1	2.600	--	.250	--	.000	--	5.000	--
I 10 E.B. M.P. 161-162	10	1.242	.247	.245	.044	2.200	3.327	5.000	.000
	5	1.290	.272	.230	.045	3.600	4.336	5.000	.000
	3	1.270	.171	.267	.029	3.333	5.774	5.000	.000
	1	1.320	--	.250	--	10.000	--	5.000	.000
I 40 E.B. M.P. 9-10	10	.909	.144	.155	.044	.100	.316	5.000	.000
	5	.930	.116	.160	.042	.200	.447	5.000	.000
	3	1.030	.171	.150	.050	.000	.000	5.000	.000
	1	.840	--	.150	--	.000	--	5.000	--
SR 68 E.B. M.P. 15-16	10	1.581	.227	.180	.092	.700	1.060	5.000	.000
	5	1.644	.294	.130	.097	.800	1.304	5.000	.000
	3	1.570	.335	.250	.050	1.000	1.000	5.000	.000
	1	1.320	--	.200	--	.000	--	5.000	--
I 10 W.B. M.P. 343-344	10	0.821	0.153	0.390	0.094	10.100	5.216	4.650	0.337
	5	0.810	0.122	0.380	0.076	11.200	6.301	4.600	0.418
	3	0.820	0.046	0.483	0.126	13.667	7.095	4.667	0.289
	1	0.780	--	0.500	--	20.000	--	5.000	--
US 70 E.B. M.P. 379-380	10	1.674	0.561	0.065	0.047	6.500	5.233	4.500	0.850
	5	1.434	0.554	0.050	0.035	5.600	5.550	4.400	0.894
	3	1.410	0.483	0.050	0.050	9.000	7.937	4.333	1.155
	1	1.260	--	0.100	--	0.000	--	3.000	--
SR 75 N.B. M.P. 387-388	10	1.740	0.343	0.145	0.044	5.100	2.807	5.000	0.000
	5	1.746	0.453	0.140	0.042	5.600	2.881	5.000	0.000
	3	1.480	0.294	0.133	0.058	4.000	2.646	5.000	0.000
	1	1.650	--	0.100	--	5.000	--	5.000	--
I-17 N.B. M.P. 219-220	10	1.300	0.310	0.280	0.300	26.000	17.710	4.950	0.160
	5	1.220	0.250	0.280	0.300	34.000	19.490	5.000	0.000
	3	1.350	0.210	0.420	0.330	35.000	27,840	5.000	0.000
	1	1.200	--	0.700	--	60.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
U.S. 66 E.B. M.P. 64-65	10	1.575	0.309	0.665	0.384	34.200	27.133	5.000	0.000
	5	1.488	0.272	0.580	0.415	28.400	28.457	5.000	0.000
	3	1.530	0.390	0.433	0.321	19.000	23.065	5.000	0.000
	1	1.080	--	0.200	--	1.000	--	5.000	--
I 17 N.B. M.P. 224-225	10	1.450	0.446	0.230	0.095	15.000	20.331	5.000	0.000
	5	1.484	0.529	0.220	0.084	11.800	7.497	5.000	0.000
	3	1.400	0.481	0.200	0.000	12.333	6.807	5.000	0.000
	1	0.900	--	0.200	--	20.000	--	5.000	--
US 89 N.B. M.P. 269-270	10	1.019	0.289	0.145	0.101	0.000	0.000	5.000	0.000
	5	0.952	0.279	0.150	0.141	0.000	0.000	5.000	0.000
	3	0.997	0.364	0.200	0.173	0.000	0.000	5.000	0.000
	1	0.590	--	0.400	--	0.000	--	5.000	--
US 289 W.B. M.P. 6-7	10	1.102	0.295	0.160	0.081	6.100	10.365	4.900	0.211
	5	1.032	0.206	0.170	0.067	5.800	8.167	4.900	0.244
	3	1.070	0.262	0.100	0.000	2.000	1.000	4.833	0.289
	1	0.780	--	0.100	--	0.000	--	4.500	--
I-10 W.B. M.P. 344-345	10	0.831	0.209	0.295	0.080	6.000	2.494	4.700	0.258
	5	0.834	0.305	0.250	0.087	4.600	2.702	4.700	0.274
	3	0.640	0.225	0.233	0.115	4.667	4.509	4.833	0.289
	1	0.380	--	0.100	--	0.000	--	5.000	--
U.S. 95 N.B. M.P. 10-11	10	0.882	0.091	0.110	0.052	2.600	1.713	5.000	0.000
	5	0.912	0.119	0.090	0.055	2.600	1.673	5.000	0.000
	3	0.870	0.052	0.133	0.058	2.667	0.577	5.000	0.000
	1	0.840	--	0.100	--	3.000	--	5.000	--
SR 92 E.B. M.P. 350-351	10	.803	.320	.095	.044	1.600	1.506	5.000	.000
	5	.794	.293	.090	.042	2.400	1.673	5.000	.000
	3	.670	.285	.083	.058	1.333	.577	5.000	.000
	1	.960	--	.050	--	2.000	--	5.000	--
I-10 W.B. M.P. 175-176	10	1.578	0.209	0.355	0.585	20.500	11.414	5.000	0.000
	5	1.536	0.228	0.170	0.084	17.000	4.472	5.000	0.000
	3	1.630	0.233	0.117	0.029	16.000	5.773	5.000	0.000
	1	1.440	--	0.150	--	20.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
I-8 W.B. M.P. 58-59	10	0.913	0.358	0.115	0.041	6.400	2.459	5.000	0.000
	5	0.908	0.424	0.100	0.035	7.200	3.114	5.000	0.000
	3	1.080	0.364	0.100	0.050	6.333	3.512	5.000	0.000
	1	1.500	--	0.150	--	3.000	--	5.000	--
SR 68 E.B. M.P. 14-15	10	1.170	0.341	0.170	0.106	2.700	2.669	5.000	0.000
	5	1.152	0.290	0.200	0.117	1.800	1.924	5.000	0.000
	3	1.250	0.493	0.167	0.104	2.333	3.215	5.000	0.000
	1	0.690	--	0.050	--	0.000	--	5.000	--
US 70 E.B. M.P. 349-350	10	0.754	0.198	0.155	0.126	0.000	0.000	5.000	0.000
	5	0.690	0.141	0.130	0.084	0.000	0.000	5.000	0.000
	3	0.720	0.150	0.200	0.200	0.000	0.000	5.000	0.000
	1	0.870	--	0.200	--	0.000	--	5.000	--
US 70 E.B. M.P. 350-351	10	0.805	0.223	0.100	0.094	0.000	0.000	5.000	0.000
	5	0.876	0.256	0.120	0.110	0.000	0.000	5.000	0.000
	3	0.903	0.251	0.133	0.058	0.000	0.000	5.000	0.000
	1	1.140	--	0.100	--	0.000	--	5.000	--
US 70 E.B. M.P. 353-354	10	0.930	0.241	0.180	0.042	0.000	0.000	5.000	0.000
	5	1.008	0.253	0.190	0.042	0.000	0.000	5.000	0.000
	3	0.860	0.213	0.183	0.029	0.000	0.000	5.000	0.000
	1	0.900	--	0.150	--	0.000	--	5.000	--
I-10 W.B. M.P. 338-339	10	1.566	0.424	0.280	0.132	5.900	5.343	4.850	0.242
	5	1.662	0.382	0.290	0.171	4.200	2.588	4.900	0.224
	3	1.750	0.455	0.267	0.161	4.667	3.512	5.000	0.000
	1	1.830	--	0.150	--	1.000	--	5.000	--
SR 92 E.B. M.P. 348-349	10	1.062	0.173	0.125	0.049	4.500	2.838	5.000	0.000
	5	1.026	0.107	0.140	0.042	4.400	3.782	5.000	0.000
	3	0.920	0.183	0.183	0.020	4.667	3.786	5.000	0.000
	1	0.960	--	0.200	--	9.000	--	5.000	--
S.R. 90 E.B. M.P. 300-301	10	0.848	0.169	0.110	0.046	6.100	1.450	5.000	0.000
	5	0.856	0.220	0.130	0.057	6.400	1.817	5.000	0.000
	3	0.843	0.281	0.133	0.076	7.33	1.155	5.000	0.000
	1	1.140	--	0.200	--	8.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
I-10 W.B. M.P. 189-190	10	0.804	0.286	0.360	0.046	1.600	1.075	5.000	0.000
	5	0.772	0.239	0.340	0.022	1.600	1.140	5.000	0.000
	3	0.850	0.315	0.383	0.058	0.667	0.577	5.000	0.000
	1	0.840	--	0.350	--	1.000	--	5.000	--
I-10 E.B. M.P. 196-197	10	1.413	0.614	0.355	0.060	5.818	7.054	4.550	0.284
	5	1.234	0.691	0.330	0.057	4.000	4.301	4.600	0.224
	3	1.570	0.750	0.350	0.050	4.000	5.196	4.667	0.289
	1	2.220	--	0.300	--	1.000	--	4.500	--
I-10 W.B. M.P. 180-181	10	0.801	0.309	0.270	0.035	4.500	5.503	5.000	0.000
	5	0.884	0.379	0.260	0.042	3.000	4.123	5.000	0.000
	3	0.727	0.643	0.283	0.029	4.000	5.292	5.000	0.000
	1	0.700	--	0.300	--	2.000	--	5.000	--
I-10 E.B. M.P. 190-191	10	1.128	0.233	0.380	0.063	7.900	2.424	5.000	0.000
	5	0.996	0.039	0.380	0.045	8.000	1.581	5.000	0.000
	3	0.980	0.035	0.350	0.050	7.333	2.517	5.000	0.000
	1	0.960	--	0.400	--	1.000	--	5.000	--
I10 W.B. M.P. 165-166	10	0.996	0.223	0.335	0.063	2.000	2.000	5.000	0.000
	5	0.960	0.298	0.320	0.045	1.600	2.510	5.000	0.000
	3	1.130	0.288	0.333	0.058	2.667	1.528	5.000	0.000
	1	1.440	--	0.300	--	0.000	--	5.000	--
I-10 W.B. M.P. 158-159	10	0.681	0.118	0.440	0.194	0.000	0.000	4.750	0.264
	5	0.670	0.115	0.380	0.189	0.000	0.000	4.800	0.274
	3	0.710	0.125	0.333	0.252	0.000	0.000	4.667	0.289
	1	0.750	--	0.666	--	0.000	--	5.000	--
I-10 E.B. M.P. 159-160	10	0.848	0.069	0.345	0.098	0.000	0.000	4.600	0.568
	5	0.856	0.087	0.360	0.102	0.000	0.000	4.500	0.707
	3	0.803	0.032	0.283	0.104	0.000	0.000	4.667	0.577
	1	0.790	--	0.400	--	0.000	0.000	4.000	--
I-10 - E.B. M.P. 177-178	10	0.901	0.165	0.300	0.122	10.600	3.627	5.000	0.000
	5	0.872	0.211	0.290	0.119	11.800	4.817	5.000	0.000
	3	0.783	0.232	0.283	0.153	8.667	1.155	5.000	0.000
	1	0.960	--	0.150	--	8.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
I-10 - E.B.	10	0.826	0.125	0.275	0.079	7.700	3.368	5.000	0.000
M.P. 178-179	5	0.824	0.182	0.240	0.042	9.600	3.847	5.000	0.000
	3	0.840	0.052	0.267	0.076	7.333	4.163	5.000	0.000
	1	0.810	--	0.200	--	4.000	--	5.000	--
I-10 E.B.	10	0.812	0.226	0.275	0.054	6.300	2.263	4.950	0.158
M.P. 183-184	5	0.834	0.268	0.300	0.050	6.800	1.304	4.900	0.224
	3	0.850	0.255	0.283	0.029	5.667	1.528	5.000	0.000
	1	0.660	--	0.300	--	7.000	--	5.000	--
I-10 E.B.	10	0.895	0.304	0.385	0.053	9.300	3.860	5.000	0.000
M.P. 182-183	5	0.842	0.240	0.410	0.055	8.600	1,817	5.000	0.000
	3	0.740	0.269	0.367	0.029	8.000	2.646	5.000	0.000
	1	0.600	--	0.400	--	7.000	--	5.000	--
SR 260 E.B.	10	0.665	0.299	0.140	0.046	0.400	1.265	5.000	0.000
M.P. 306-307	5	0.624	0.216	0.130	0.045	0.000	0.000	5.000	0.000
	3	0.557	0.234	0.167	0.058	0.000	0.000	5.000	0.000
	1	0.510	--	0.200	--	0.000	--	5.000	--
S.R. 260-E.B.	10	0.747	0.075	0.175	0.079	0.000	0.000	5.000	0.000
M.P. 309-310	5	0.762	0.089	0.170	0.084	0.000	0.000	5.000	0.000
	3	0.800	0.075	0.150	0.050	0.000	0.000	5.000	0.000
	1	0.870	--	0.150	--	0.000	--	5.000	--
SR 260 E.B.	10	0.632	0.101	0.190	0.021	0.000	0.000	5.000	0.000
M.P. 313-314	5	0.642	0.120	0.190	0.022	0.000	0.000	5.000	0.000
	3	0.627	0.083	0.200	0.000	0.000	0.000	5.000	0.000
	1	0.720	--	0.200	--	0.000	0.000	5.000	--
US 60 E.B.	10	1.356	0.318	0.170	0.035	0.600	0.700	5.000	0.000
M.P. 372-373	5	1.476	0.341	0.160	0.042	0.800	0.837	5.000	0.000
	3	1.420	0.139	0.167	0.029	1.000	1.000	5.000	0.000
	1	1.260	--	0.150	--	2.000	--	5.000	--
US 60 E.B.	10	1.380	0.212	0.165	0.058	0.400	0.516	5.000	0.000
M.P. 373-374	5	1.326	0.113	0.180	0.057	0.400	0.548	5.000	0.000
	3	1.181	0.151	0.150	0.050	0.667	0.577	5.000	0.000
	1	1.260	--	0.150	--	0.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR 93 N.B. M.P. 237-238	10	1.005	0.169	0.215	0.034	1.000	1.633	4.900	0.211
	5	0.996	0.121	0.230	0.045	1.600	2.074	4.900	0.224
	3	1.050	0.108	0.233	0.058	2.000	2.646	4.833	0.289
	1	0.930	--	0.300	--	5.000	--	5.000	--
I 8 E.B. M.P. 161-162	10	1.023	0.350	0.455	0.130	11.400	7.043	5.000	0.000
	5	0.942	0.280	0.470	0.097	12.600	7.092	5.000	0.000
	3	0.880	0.335	0.383	0.104	8.667	7.095	5.000	0.000
	1	0.630	--	0.350	--	1.000	--	5.000	--
I-10 E.B. M.P. 234-235	10	.709	.068	.105	.016	.000	.000	5.000	.000
	5	.698	.094	.100	.000	.000	.000	5.000	.000
	3	.643	.086	.100	.000	.000	.000	5.000	.000
	1	.660	--	.100	--	.000	--	5.000	--
I 17 N.B. M.P. 226-227	10	.697	.247	.235	.100	2.200	3.360	5.000	.000
	5	.704	.309	.250	.141	4.000	4.062	5.000	.000
	3	.590	.046	.183	.029	2.000	3.464	5.000	.000
	1	.540	--	.200	--	6.000	--	5.000	--
I 17 N.B. M.P. 227-228	10	.762	.220	.230	.048	8.300	7.818	5.000	.000
	5	.816	.257	.240	.055	5.600	5.983	5.000	.000
	3	.960	.216	.233	.058	7.333	7.506	5.000	.000
	1	.780	---	.200	---	.000	--	5.000	---
SR 186 E.B. M.P. 349-350	10	1.618	.524	.130	.095	.000	.000	5.000	.000
	5	1.602	.618	.160	.089	.000	.000	5.000	.000
	3	1.480	.429	.167	.153	.000	.000	5.000	.000
	1	1.080	--	.300	--	.000	--	5.000	--
SR 186 E.B. M.P. 350-351	10	1.455	.576	.160	.154	.000	.000	5.000	.000
	5	1.188	.586	.180	.168	.000	.000	5.000	.000
	3	1.250	.997	.117	.104	.000	.000	5.000	.000
	1	.630	--	.150	--	.000	--	5.000	--
I-10 E.B. M.P. 171-172	10	1.293	.324	.205	.016	1.900	1.729	5.000	.000
	5	1.170	.240	.210	.022	2.000	1.414	5.000	.000
	3	1.240	.193	.217	.029	.667	1.155	5.000	.000
	1	1.380	--	.200	--	2.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
I-10 E.B. M.P. 172-173	10	1.044	.234	.200	.000	.600	.843	5.000	.000
	5	.876	.209	.200	.000	.000	.000	5.000	.000
	3	.980	.227	.200	.000	.000	.000	5.000	.000
	1	1.140	--	.200	--	.000	--	5.000	--
I-10 W.B. M.P. 339-340	10	1.374	.303	.100	.062	1.800	1.989	4.500	.667
	5	1.362	.318	.130	.067	2.600	2.510	4.500	.866
	3	1.430	.416	.083	.104	1.000	1.732	4.333	1.155
	1	1.320	--	.050	--	3.000	--	5.000	--
I-10 W.B. M.P. 340-341	10	1.467	.287	.270	.155	4.000	3.127	4.300	.789
	5	1.608	.303	.230	.172	3.400	2.074	3.800	.758
	3	1.610	.513	.250	.218	2.667	2.082	3.833	.764
	1	1.860	--	.150	--	2.000	--	5.000	.000
I-10 E.B. M.P. 235-236	10	.679	.069	.095	.016	.000	.000	5.000	.000
	5	.678	.075	.100	.000	.000	.000	5.000	.000
	3	.650	.046	.100	.000	.000	.000	5.000	.000
	1	.600	--	.100	--	.000	.000	5.000	--
I-10 E.B. M.P. 236-237	10	.518	.124	.055	.126	.000	.000	5.000	.000
	5	.552	.135	.090	.175	.000	.000	5.000	.000
	3	.443	.086	.017	.029	.000	.000	5.000	.000
	1	.520	--	.050	--	.000	--	5.000	--
S.R. 90 E.B. M.P. 310-311	10	.274	.082	.170	.035	.000	.000	5.000	.000
	5	.284	.090	.180	.027	.000	.000	5.000	.000
	3	.237	.031	.150	.050	.000	.000	5.000	.000
	1	.270	--	.150	--	.000	--	5.000	---
S.R. 90 E.B. M.P. 311-312	10	.565	.137	.170	.054	.000	.000	5.000	.000
	5	.560	.198	.180	.076	.000	.000	5.000	.000
	3	.493	.000	.133	.029	.000	.000	5.000	.000
	1	.460	--	.100	--	.000	--	5.000	--
SR 90 E.B. M.P. 298-299	10	.741	.139	.145	.044	2.500	1.179	5.000	.000
	5	.810	.042	.150	.035	2.200	1.304	5.000	.000
	3	.790	.087	.117	.029	2.667	.577	5.000	.000
	1	.840	--	.100	--	2.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR 90 E.B.	10	.687	.167	.135	.024	3.300	1.494	5.000	.000
M.P. 299-300	5	.780	.097	.140	.022	4.000	1.000	5.000	.000
	3	.643	.235	.117	.029	2.667	2.517	5.000	.000
	1	.870	--	.100	--	5.000	--	5.000	--
S.R. 68 E.B.	10	.692	.343	.200	.091	.000	.000	5.000	.000
M.P. 10-11	5	.640	.264	.180	.084	.000	.000	5.000	.000
	3	.873	.524	.200	.100	.000	.000	5.000	.000
	1	.490	--	.300	--	.000	--	5.000	--
SR 68 E.B.	10	1.042	.451	.050	.058	0.200	0.632	5.000	.000
M.P. 11-12	5	1.128	.296	.050	.050	0.400	0.894	5.000	.000
	3	1.070	.380	.033	.058	0.000	0.000	5.000	.000
	1	1.140	--	.100	--	0.000	--	5.000	--
SR 98 E.B.	10	0.807	0.406	0.165	0.041	0.000	0.000	4.500	0.000
M.P. 320-321	5	0.702	0.126	0.160	0.041	0.000	0.000	4.500	0.000
	3	0.513	0.167	0.166	0.057	0.000	0.000	4.500	0.000
	1	0.600	--	0.100	--	0.000	--	4.500	--
SR 98 E.B.	10	0.782	0.261	0.145	0.036	0.200	0.421	4.800	0.349
M.P. 323-324	5	0.846	0.249	0.140	0.041	0.000	0.000	4.700	0.447
	3	0.900	0.334	0.150	0.050	0.000	0.000	4.666	0.577
	1	0.960	--	0.200	--	0.000	--	4.000	--
SR 98 E.B.	10	0.819	0.232	0.205	0.098	0.100	0.316	4.500	0.527
M.P. 318-319	5	0.926	0.239	0.210	0.082	0.200	0.447	4.600	0.651
	3	0.863	0.285	0.233	0.104	0.333	0.577	4.666	0.577
	1	1.110	--	0.350	--	1.000	--	5.000	--
SR 98 E.B.	10	1.218	0.179	0.125	0.026	0.000	0.000	4.450	0.368
M.P. 315-316	5	1.182	0.191	0.130	0.027	0.000	0.000	4.500	0.353
	3	1.110	0.079	0.116	0.028	0.000	0.000	4.666	0.288
	1	1.050	--	0.150	--	0.000	0.000	4.500	--
SR 98 E.B.	10	1.365	0.309	0.130	0.034	0.000	0.000	5.000	0.000
M.P. 312-313	5	1.410	0.389	0.140	0.042	0.000	0.000	5.000	0.000
	3	1.610	0.285	0.116	0.028	0.000	0.000	5.000	0.000
	1	1.620	--	0.100	--	0.000	0.000	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR 98 E.B.	10	1.032	0.289	0.110	0.021	0.200	0.632	5.000	0.000
M.P. 310-311	5	0.999	0.130	0.110	0.022	0.000	0.000	5.000	0.000
	3	1.060	0.124	0.100	0.000	0.666	1.154	5.000	0.000
	1	0.960	--	0.100	--	0.000	--	5.000	--
SR 98 E.B.	10	0.912	0.313	0.110	0.039	0.000	0.000	4.500	0.333
M.P. 308-309	5	0.854	0.290	0.100	0.000	0.000	0.000	4.400	0.418
	3	1.060	0.180	0.133	0.057	0.000	0.000	4.500	0.500
	1	1.080	--	0.100	--	0.000	--	5.000	--
SR 98 E.B.	10	0.969	0.125	0.175	0.120	0.000	0.000	4.200	0.421
M.P. 307-308	5	0.948	0.153	0.170	0.027	0.000	0.000	4.200	0.447
	3	1.040	0.121	0.166	0.028	0.000	0.000	4.000	0.500
	1	1.020	--	0.150	--	0.000	--	4.500	--
SR 98 E.B.	10	0.909	0.131	0.100	0.000	0.000	0.000	4.550	0.437
M.P. 306-307	5	0.930	0.152	0.100	0.000	0.000	0.000	4.600	0.418
	3	0.880	0.153	0.100	0.000	0.000	0.000	4.666	0.577
	1	0.750	--	0.100	--	0.000	--	5.000	--
SR 389 E.B.	10	1.080	0.209	0.185	0.047	0.600	1.265	5.000	0.000
M.P. 8-9	5	1.122	0.241	0.180	0.057	0.800	1.789	5.000	0.000
	3	1.140	0.103	0.166	0.057	0.000	0.003	5.000	0.000
	1	1.200	--	0.100	--	0.000	--	5.000	--
I-40 W.B.	10	0.615	0.169	0.610	0.846	4.500	2.505	5.000	0.000
M.P. 208-209	5	0.618	0.219	0.300	0.707	5.800	2.588	5.000	0.000
	3	0.613	0.250	0.300	0.000	5.333	4.509	5.000	3.333
	1	0.440	--	0.300	--	5.000	--	5.000	--
I-40 W.B.	10	0.659	0.103	0.220	0.042	16.700	6.651	5.000	0.000
M.P. 206-207	5	0.650	0.060	0.240	0.054	17.600	3.782	5.000	0.000
	3	0.676	0.047	0.200	0.000	21.000	5.292	5.000	0.000
	1	0.660	--	0.200	--	23.000	--	5.000	--
I-40 W.B.	9	0.636	0.333	0.238	0.054	5.777	6.139	4.944	0.167
M.P. 205-206	5	0.514	0.215	0.240	0.041	3.600	2.302	4.900	0.224
	3	0.576	0.105	0.266	0.076	4.333	2.886	4.902	8.250
	1	0.580	--	0.200	--	6.000	--	5.000	--

Appendix A
Table 1A

TEST RESULTS

AVERAGE AND STANDARD DEVIATION

TEST SITE	# OF TESTS	DEFLECTION		RUT DEPTH		% CRACKING		FLUSHING	
		$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ	$\bar{x}$	σ
SR 279 N.B.	10	0.956	0.428	0.265	0.110	4.600	4.835	3.500	1.943
M.P. 294-295	5	0.854	0.538	0.256	0.122	4.600	4.774	3.500	2.061
	3	1.030	0.692	0.333	0.115	11.000	2.645	5.000	0.000
	1	1.530	--	0.200	--	10.000	--	5.000	--
I-10 W.B.	10	0.861	0.284	0.250	0.033	3.700	3.743	5.000	0.000
M.P. 178-179	5	0.888	0.398	0.240	0.042	3.400	3.715	5.000	0.000
	3	0.750	0.104	0.217	0.029	1.333	0.577	5.000	0.000
	1	0.810	--	0.200	--	2.000	--	5.000	--
I-10 E.B.	10	0.979	0.282	0.415	0.113	18.100	12.161	4.800	0.483
M.P. 48-49	5	1.108	0.299	0.420	0.130	15.800	6.419	5.000	0.000
	3	1.117	0.414	0.483	0.161	25.617	14.012	5.000	0.000
	1	0.740	--	0.300	--	12.000	--	5.000	--
I-10 E.B.	10	1.101	0.281	0.525	0.153	19.500	11.008	4.700	0.483
M.P. 49-50	5	1.182	0.313	0.490	0.152	29.200	10.986	4.600	0.548
	3	1.230	0.131	0.583	0.202	25.667	8.145	4.667	0.577
	1	1.320	--	0.550	--	35.000	--	5.000	--
I-10 E.B.	10	0.890	0.198	0.565	0.194	18.200	10.602	4.600	0.843
M.P. 50-51	5	0.918	0.142	0.530	0.110	18.800	11.432	4.600	0.894
	3	0.970	0.148	0.583	0.104	29.000	3.606	5.000	0.000
	1	0.870	--	0.550	--	32.000	--	5.000	--
SR 260 E.B.	10	0.930	0.042	0.350	0.075	0.800	1.619	5.000	0.000
M.P. 287-288	5	0.918	0.054	0.310	0.042	0.200	0.447	5.000	0.000
	3	0.940	0.017	0.317	0.076	0.000	0.000	5.000	0.000
	1	0.930	--	0.300	--	0.000	--	5.000	--
SR 260 E.B.	10	1.026	0.200	0.250	0.085	0.500	1.269	5.000	0.000
M.P. 285-286	5	0.984	0.264	0.220	0.076	1.000	1.732	5.000	0.000
	3	1.050	0.304	0.267	0.076	0.333	0.577	5.000	0.000
	1	0.720	--	0.350	--	0.000	--	5.000	--
I-8 E.B.	10	1.554	0.107	0.510	0.250	3.800	3.190	5.000	0.000
M.P. 163-164	5	1.524	0.065	0.570	0.353	2.800	3.114	5.000	0.000
	3	1.570	0.121	0.683	0.448	1.333	1.155	5.000	0.000
	1	1.590	--	1.200	--	0.000	--	5.000	--