APPENDIX A

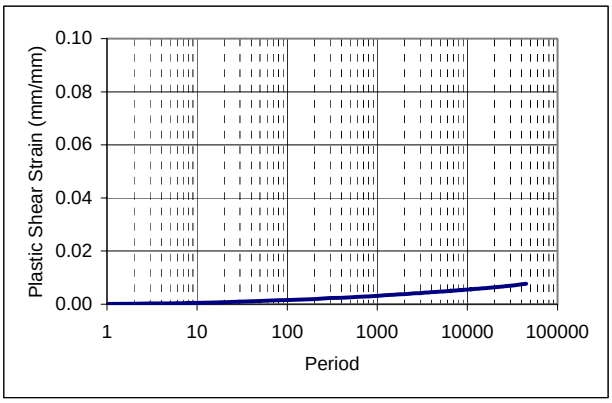
AIR VOIDS TEST RESULTS

Table A-1 In-Place Air Voids Test Results

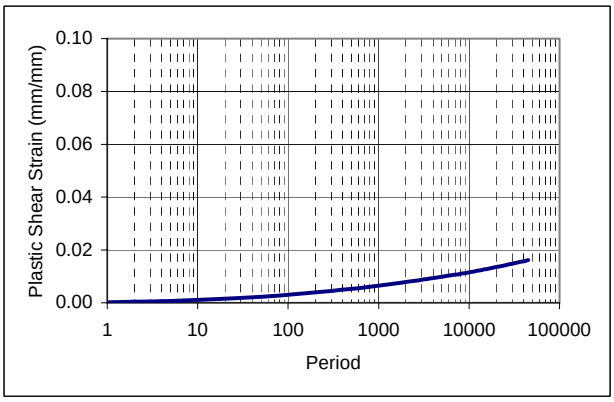
Mix	Loc.	Core ID	Weight in Air, g	Weight in Water, g	Volume	SSD Wt. in Air, g	SSD BSG	In Place Air Voids, %	CT 309 Sample	CT 309 MSG	CT 309 Avg
RAC-G (PES-1)	BPES	01	1856.2	1029.2	830.6	1859.8	2.235	6.2			
		02	1832.8	1010.2	830.7	1840.9	2.206	7.4			
		03	1866.8	1039.6	831.1	1870.7	2.246	5.8	1S1	2.388	
		04	1845.3	1017.3	831.3	1848.6	2.220	6.9	2S1	2.391	2.390
		05	1861.9	1032.8	832.7	1865.5	2.236	6.2	1S2	2.377	
		06	1837.7	1011.3	832.0	1843.3	2.209	7.3	2S2	2.379	2.378
	APES	07	1858.6	1029.6	832.9	1862.5	2.231	6.4			
		08	1825.3	1003.0	828.2	1831.2	2.204	7.5	Avg.	2.384	
		09	1859.3	1029.9	833.8	1863.7	2.230	6.5			
		10	1825.1	999.4	831.8	1831.2	2.194	8.0			
		11	1850.2	1023.3	829.8	1853.1	2.230	6.5			
		12	1822.5	998.6	831.3	1829.9	2.192	8.0			
RUMAC (PES-4)	BPES	25	1877.8	1062.1	817.5	1879.6	2.297	3.9			
		26	1863.8	1050.2	815.1	1865.3	2.287	4.4			
		27	1833.2	1021.9	813.0	1834.9	2.255	5.7	1S1	2.383	
		28	1862.0	1046.4	817.2	1863.6	2.279	4.7	2S1	2.392	2.388
		29	1858.0	1035.8	823.5	1859.3	2.256	5.6	1S2	2.388	
		30	1875.5	1061.5	815.7	1877.2	2.299	3.8	2S2	2.402	2.395
	APES	31	1858.9	1043.6	817.1	1860.7	2.275	4.9			
		32	1859.0	1061.7	813.9	1875.6	2.284	4.5	Avg.	2.391	
		33	1874.7	1061.7	813.9	1875.6	2.303	3.7			
		34	1869.3	1054.9	816.0	1870.9	2.291	4.2			
		35	1847.1	1035.2	813.7	1848.9	2.270	5.1			
MB=G (PES-6)	BPES	43	1985.6	1139.5	847.2	1986.7	2.344	3.3			
		44	1952.9	1113.7	840.4	1954.1	2.324	4.1			
		45	1978.4	1133.2	846.4	1979.6	2.337	3.5	1S1	2.423	
		46	1958.9	1116.5	843.8	1960.3	2.322	4.2	2S1	2.425	2.424
		47	1977.1	1134.3	844.0	1978.3	2.343	3.3	1S2	2.419	
		48	1956.3	1115.8	841.7	1957.5	2.324	4.1	2S2	2.425	2.422
	APES	49	2016.7	1175.3	842.7	2018.0	2.393	1.2			
		50	1988.7	1146.7	843.5	1990.2	2.358	2.7	Avg.	2.423	
		51	1988.4	1154.5	835.3	1989.8	2.380	1.8			
		52	1976.7	1142.6	835.3	1977.9	2.366	2.3			
		53	1978.8	1149.3	830.7	1980.0	2.382	1.7			
		54	2004.6	1163.2	842.4	2005.6	2.380	1.8			
MB-D (PES-7)	BPES	55	1979.5	1145.8	834.6	1980.4	2.372	3.4			
		56	1978.4	1140.0	839.9	1979.9	2.356	4.1			
		57	1989.2	1147.7	842.6	1990.3	2.361	3.9	1S1	2.459	
		58	1984.4	1144.2	841.3	1985.5	2.359	3.9	2S1	2.455	2.457
		59	1985.9	1147.2	840.2	1987.4	2.364	3.7	1S2	2.454	
		60	1974.2	1134.7	841.0	1975.7	2.347	4.4	2S2	2.454	2.454
	APES	61	1991.5	1154.7	838.0	1992.7	2.376	3.2			
		62	1974.7	1138.6	837.5	1976.1	2.358	4.0	Avg.	2.456	
		63	1982.8	1145.1	839.3	1984.4	2.362	3.8			
		64	1980.2	1143.7	838.1	1981.8	2.363	3.8			
		65	1999.2	1160.5	840.0	2000.5	2.380	3.1			
		66	1995.4	1154.0	842.7	1996.7	2.368	3.6			
DGAC (PES-9)	BPES	73	1901.8	1080.8	822.9	1903.7	2.311	6.1			
		74	1889.2	1066.4	824.6	1891.0	2.291	6.9			
		75	1902.3	1087.6	817.1	1904.7	2.328	5.4			
		76	1874.0	1055.5	820.1	1875.6	2.285	7.1			
		77	1920.1	1097.3	824.4	1921.7	2.329	5.3			
		78	1877.6	1059.6	820.1	1879.7	2.289	6.9			
	APES	79	1871.6	1053.4	820.9	1874.3	2.280	7.3			
		80	1888.4	1071.4	819.2	1890.6	2.305	6.3	Avg.	2.460	
		81	1870.2	1053.8	818.9	1872.7	2.284	7.2			
		82	1879.1	1061.8	819.4	1881.2	2.293	6.8			
		83	1875.5	1058.0	819.5	1877.5	2.289	7.0			
		84	1894.4	1072.6	823.8	1896.4	2.300	6.5			

BSG and In Place Air Voids of Cores, Full depth sections
BPES=Before Performance Monitoring Section. APES = After Performance Monitoring Section

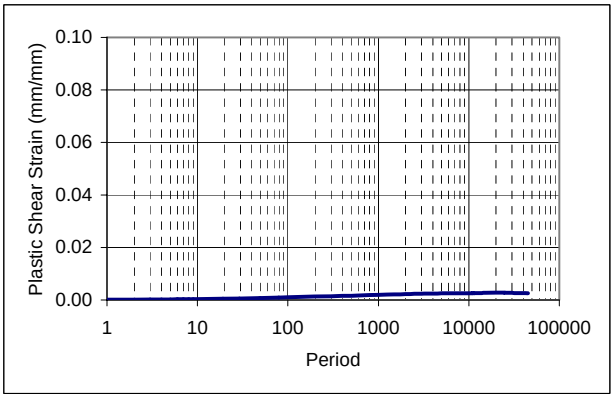
APPENDIX B
SST RUTTING TEST RESULTS



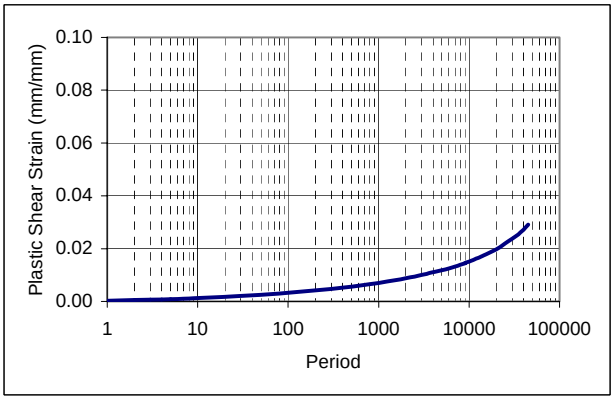
RCG01R40 Test Temperature: 40°C



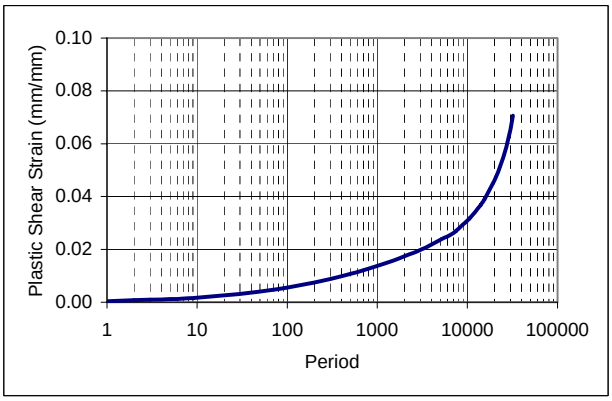
RCG02R40 Test Temperature: 40°C



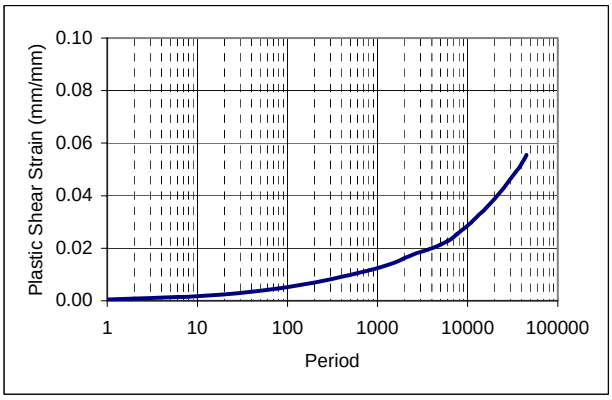
RCG03R40 Test Temperature: 40°C



RCG0950 Test Temperature: 50°C

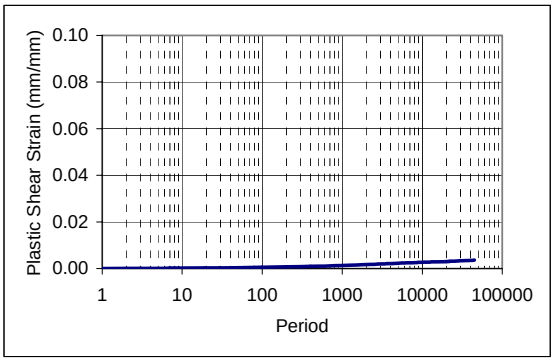


RCG07R60 Test Temperature: 60°C

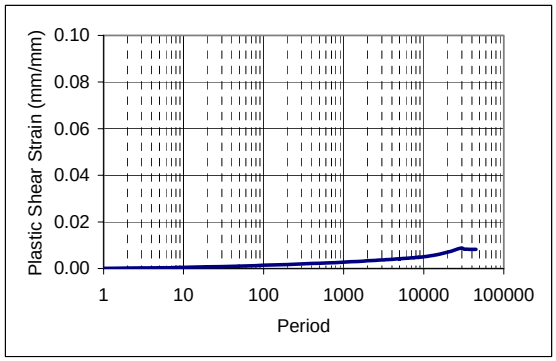


RCG08R60 Test Temperature: 60°C

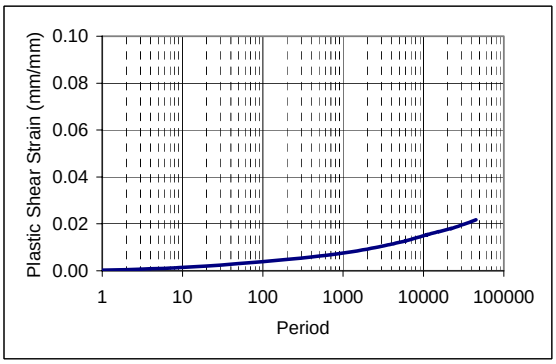
Figure B-1 Plastic Shear Strain vs. Period – RAC-G Mix



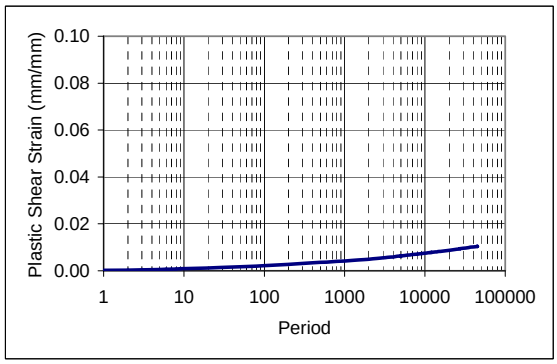
RMG25R40 Test Temperature: 40°C



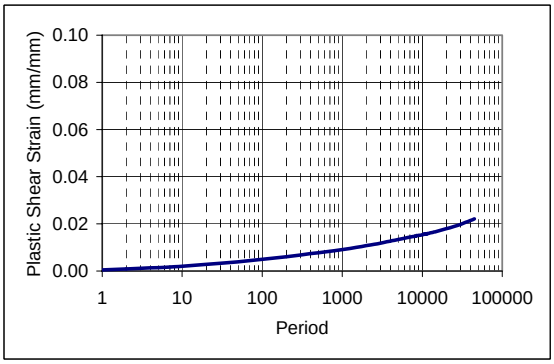
RMG26R40 Test Temperature: 40°C



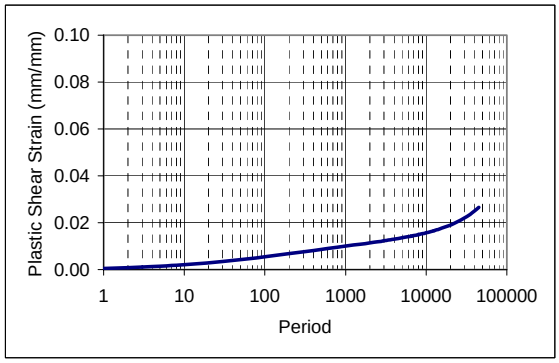
RMG27R40 Test Temperature: 40°C



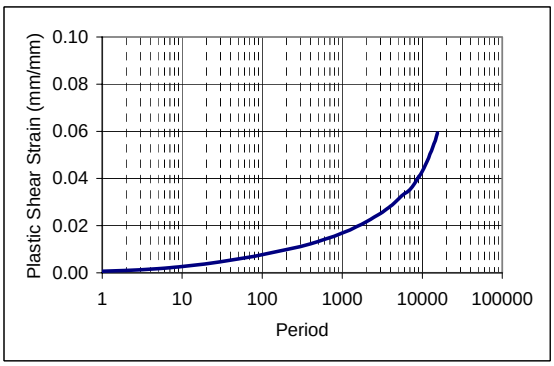
RMG28R40 Test Temperature: 40°C



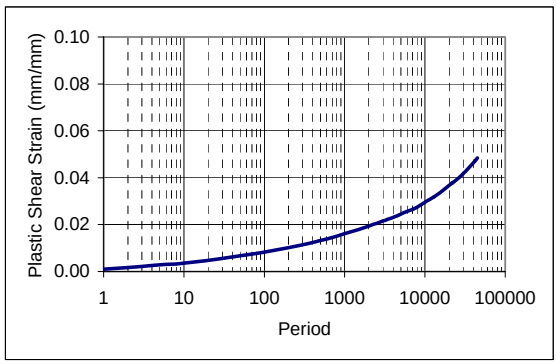
RMG33R50 Test Temperature: 50°C



RMG34R50 Test Temperature: 50°C

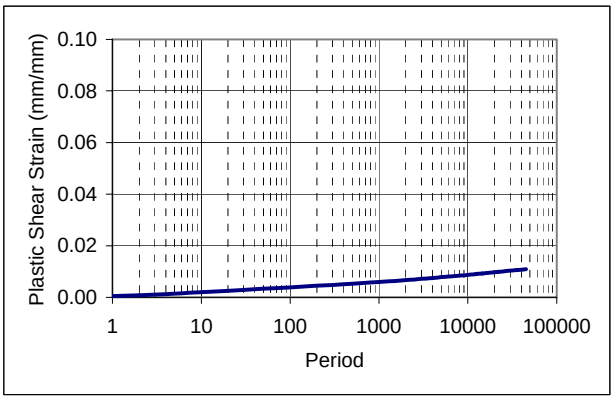


RMG31R60 Test Temperature: 60°C

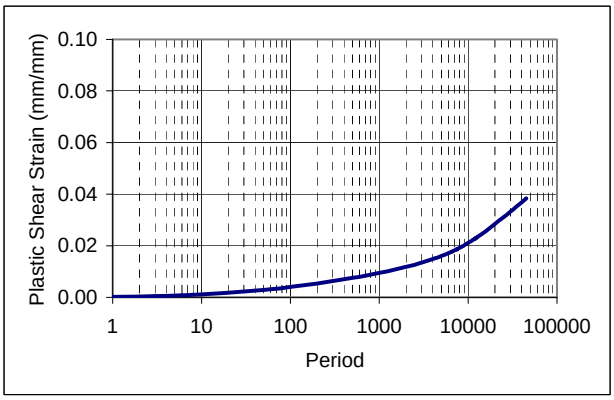


RMG32R60 Test Temperature: 60°C

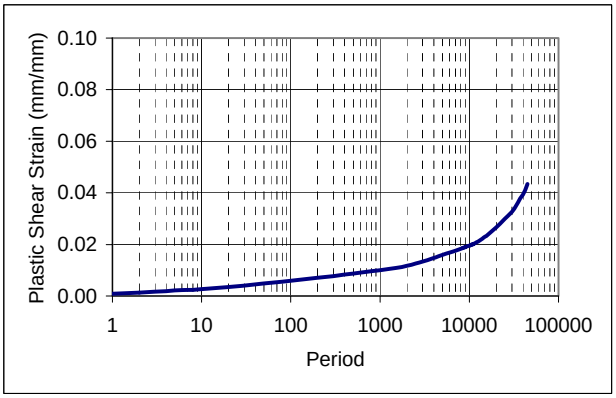
Figure B-2 Plastic Shear Strain vs. Period – RUMAC Mix



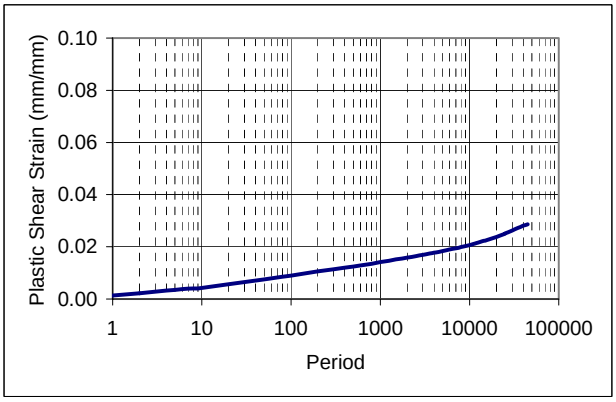
MBG52R40 Test Temperature: 40°C



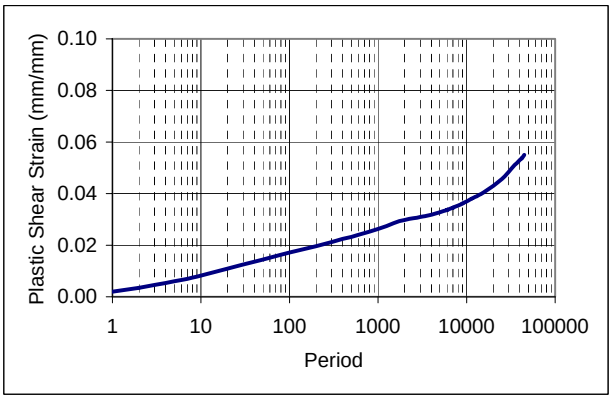
MBG53R40 Test Temperature: 40°C



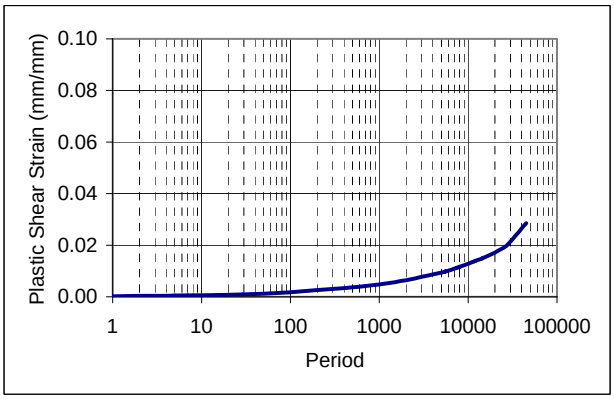
MBG46R50 Test Temperature: 50°C



MBG47R50 Test Temperature: 50°C

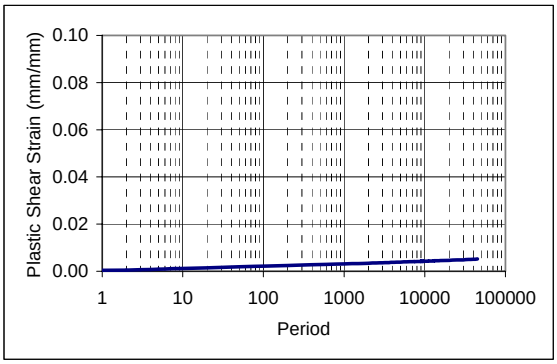


MBG49R60 Test Temperature: 60°C

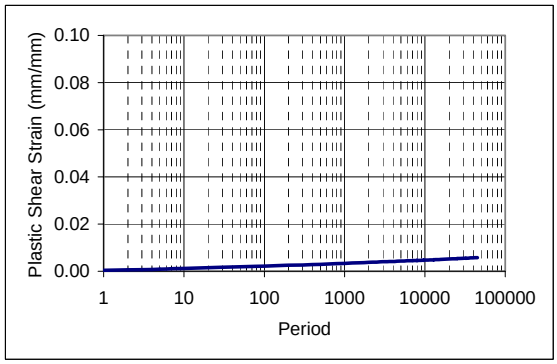


MBG50R60 Test Temperature: 60°C

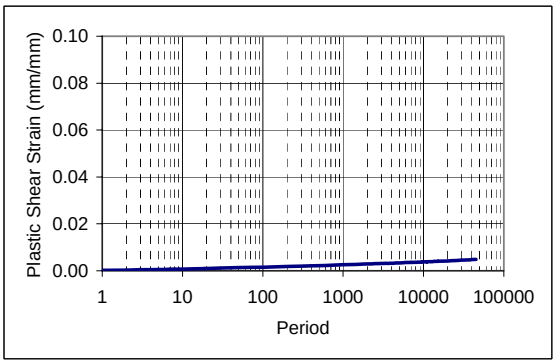
Figure B-3 Plastic Shear Strain vs. Period – MB-G Mix



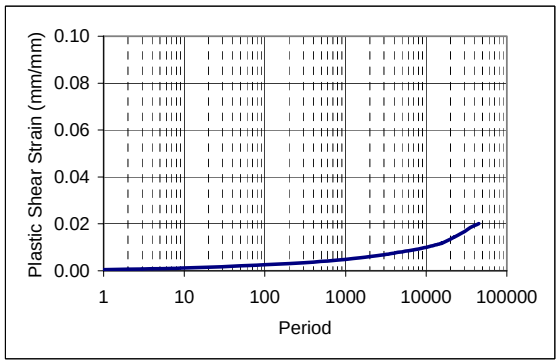
MBD56R40 Test Temperature: 40°C



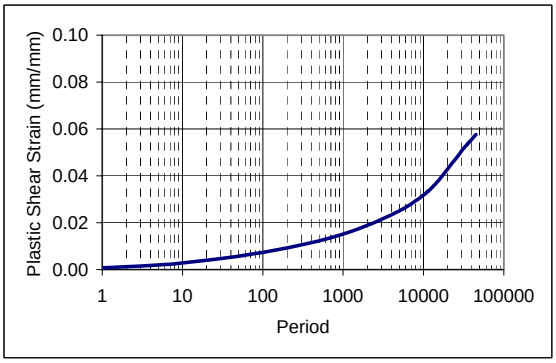
MBD57R40 Test Temperature: 40°C



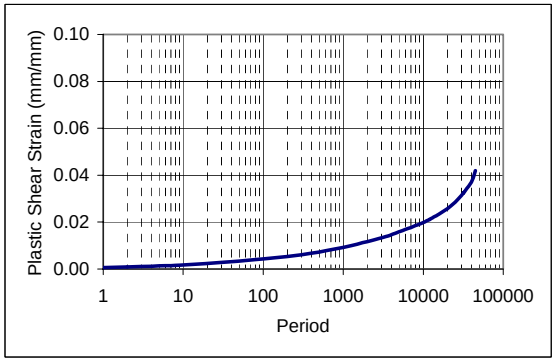
MBD58R40 Test Temperature: 40°C



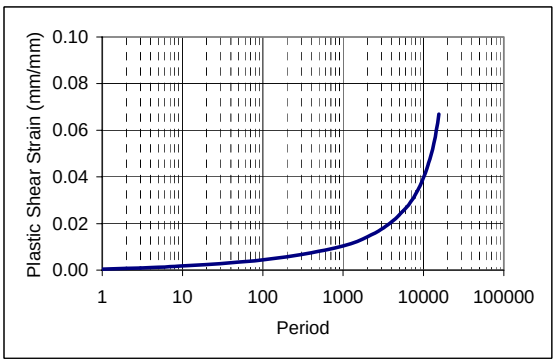
MBD63R50 Test Temperature: 50°C



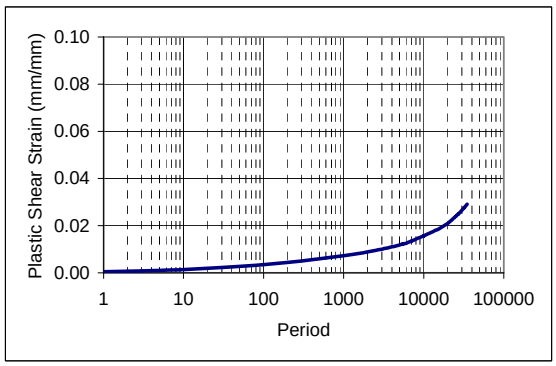
MBD64R50 Test Temperature: 50°C



MBD59R60 Test Temperature: 60°C

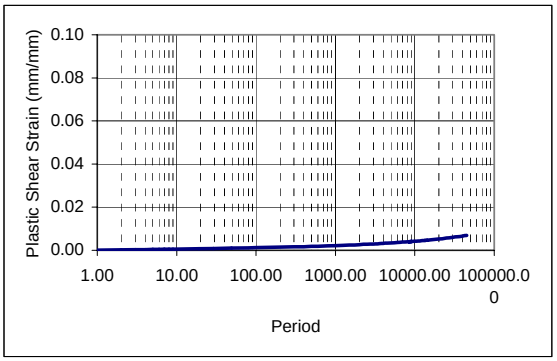


MBD60R60 Test Temperature: 60°C

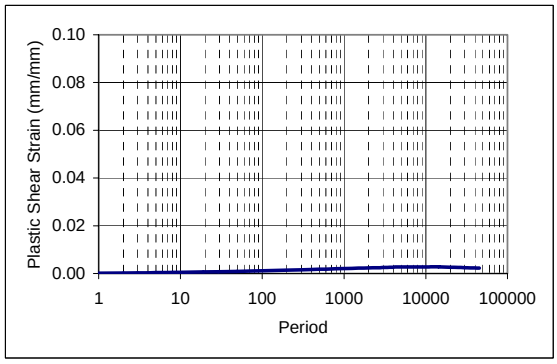


MBD61R60 Test Temperature: 60°C

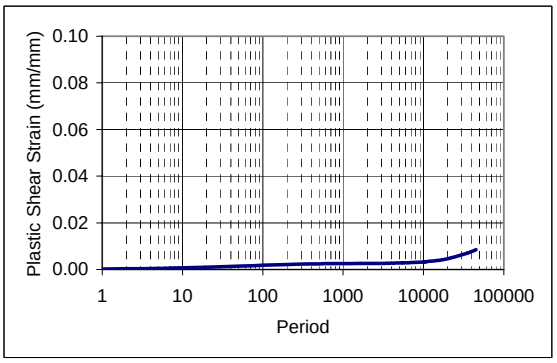
Figure B-4 Plastic Shear Strain vs. Period – MB-D Mix



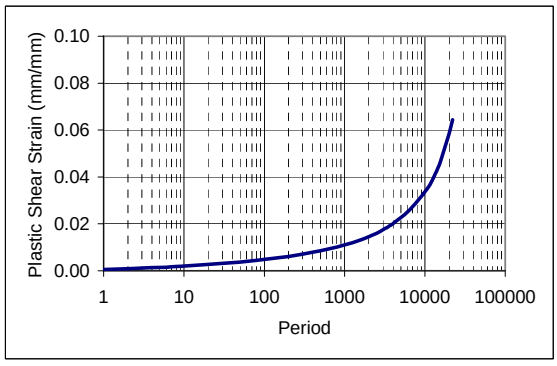
DG73R40 Test Temperature: 40°C



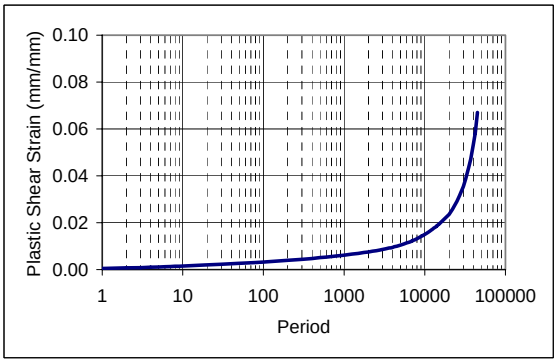
DG75R40 Test Temperature: 40°C



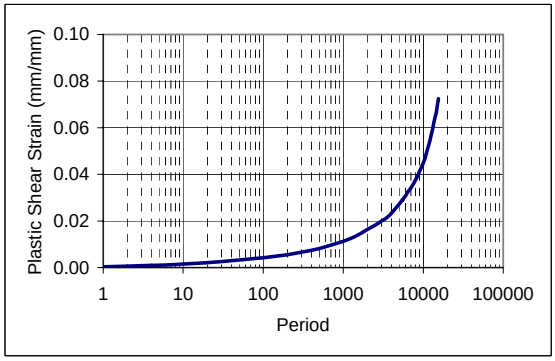
DG76R40 Test Temperature: 40°C



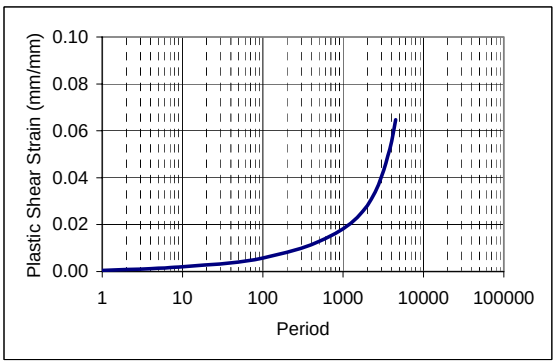
DG81R50 Test Temperature: 50°C



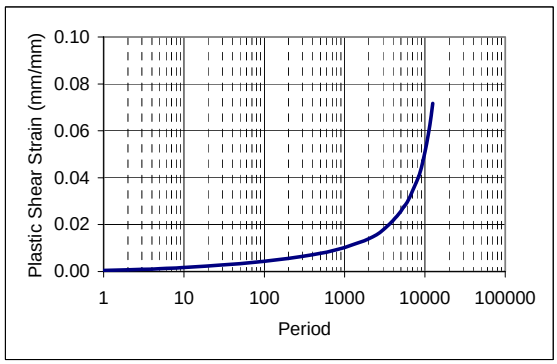
DG82R50 Test Temperature: 50°C



DG78R60 Test Temperature: 60°C



DG79R60 Test Temperature: 60°C

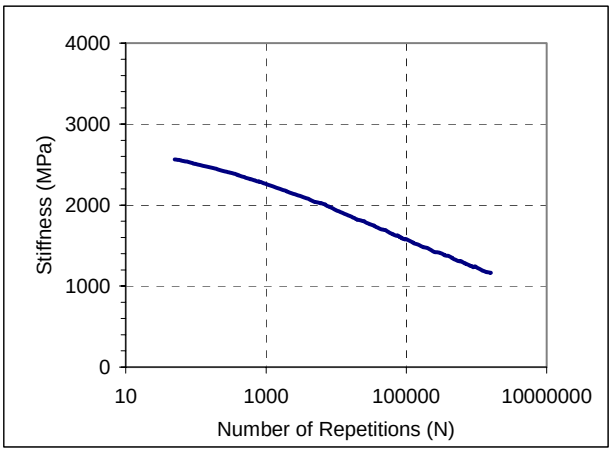


DG80R60 Test Temperature: 60°C

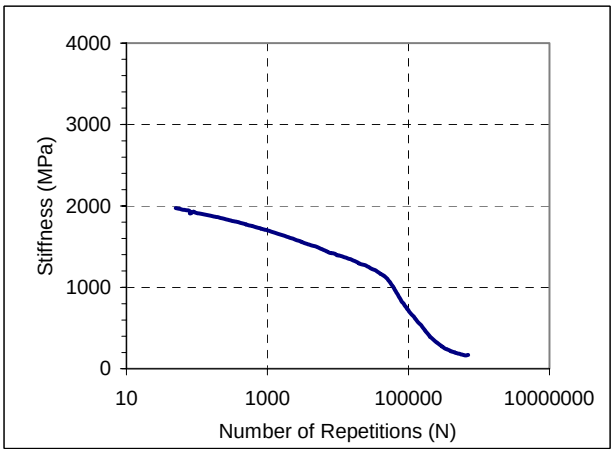
Figure B-5 Plastic Shear Strain vs. Period – DGAC Mix

APPENDIX C

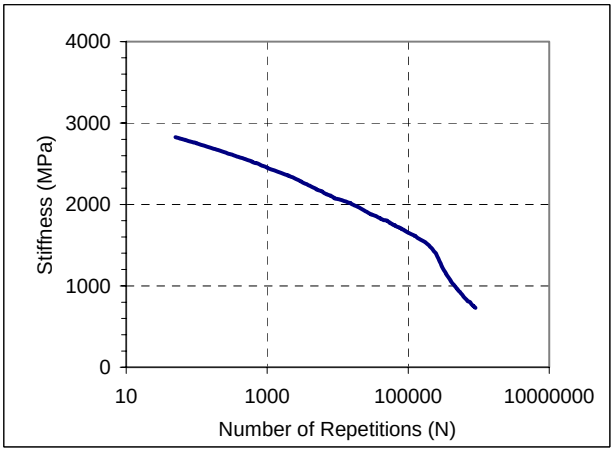
REPEATED FLEXURAL BENDING BEAM FATIGUE TEST RESULTS



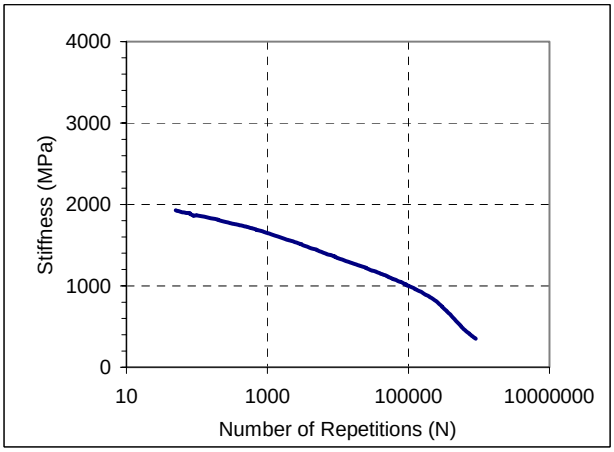
RACG3A Tested at approximately 400 με



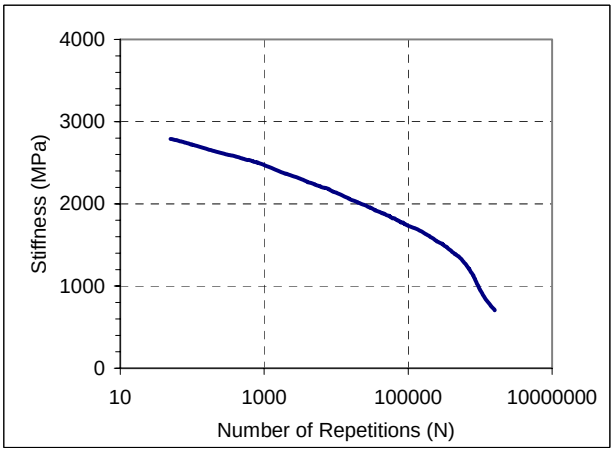
RACG4A Tested at approximately 600 με



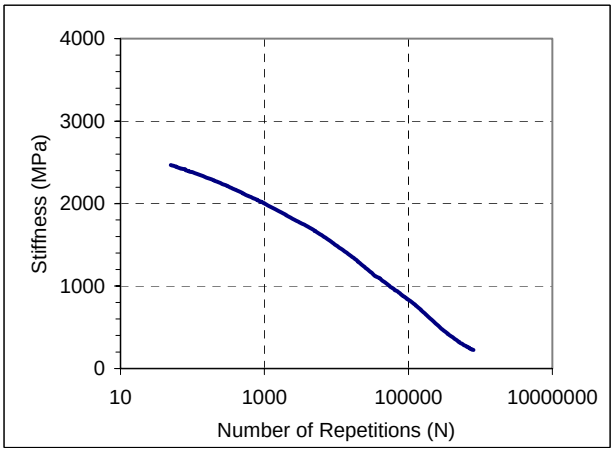
RACG3B Tested at approximately 400 με



RACG4B Tested at approximately 600 με

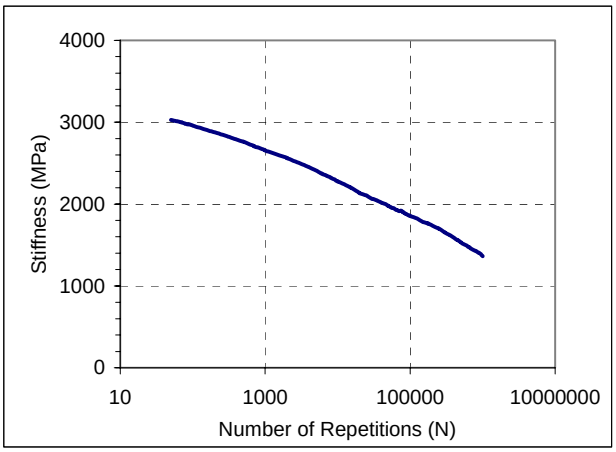


RACG4D Tested at approximately 400 με

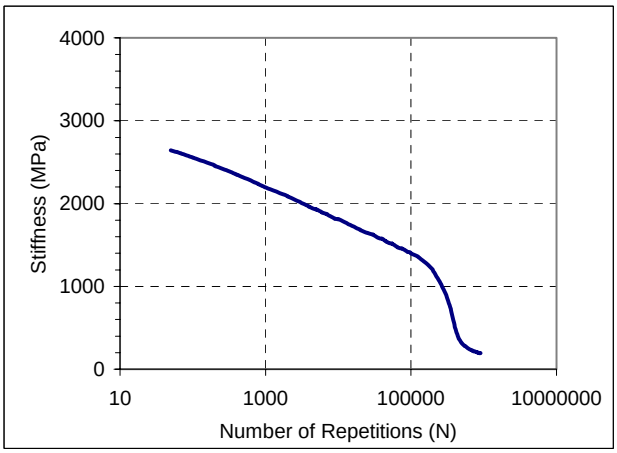


RACG4C Tested at approximately 600 με

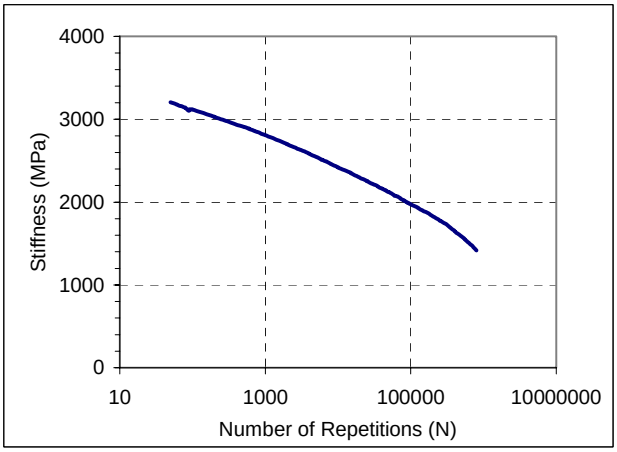
Figure C-1 Stiffness (@ 20°C) vs. Number of Repetitions – RAC-G Mix



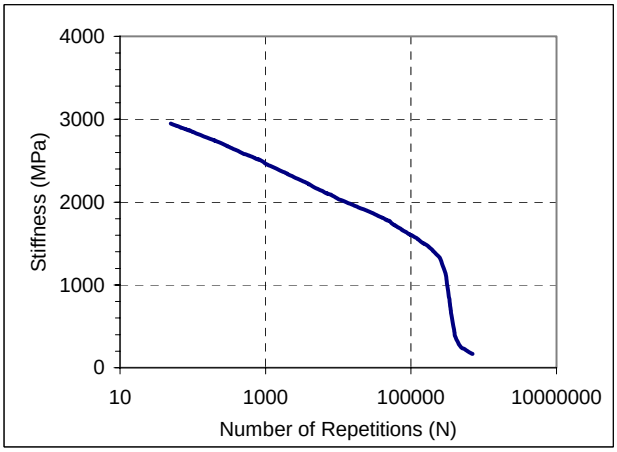
RUMC7A Tested at approximately 400 με



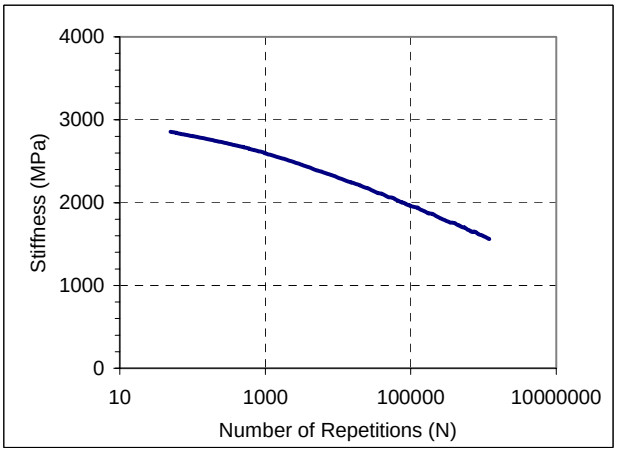
RUMC6B Tested at approximately 600 με



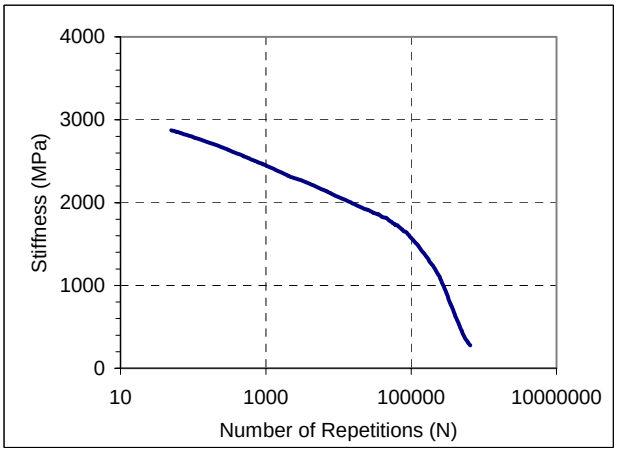
RUMC7B Tested at approximately 400 με



RUMC6C Tested at approximately 600 με

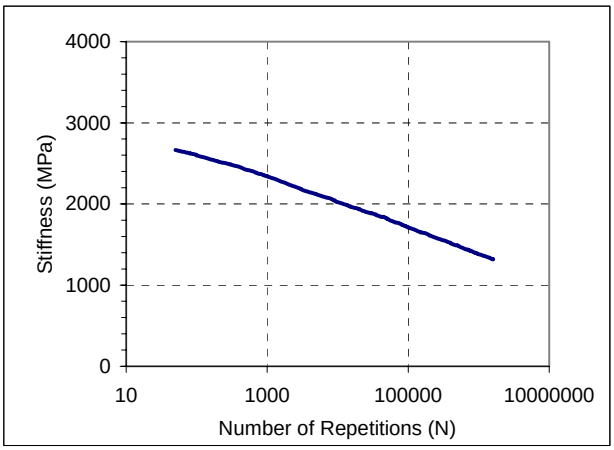


RUMC7C Tested at approximately 400 με

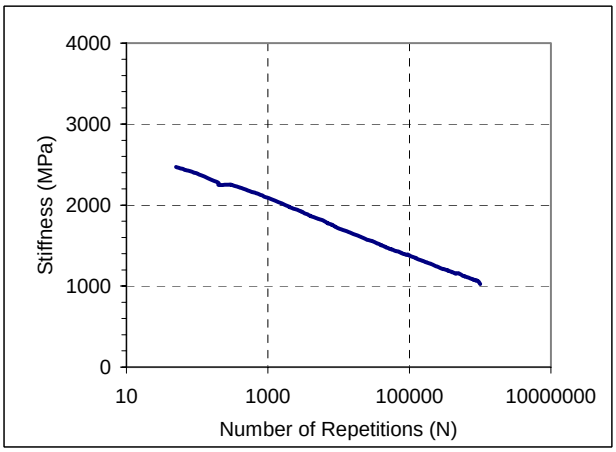


RUMC6D Tested at approximately 600 με

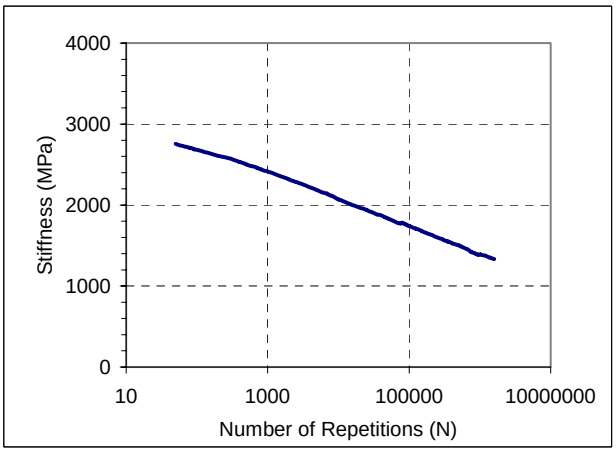
Figure C-2 Stiffness (@ 20°C) vs. Number of Repetitions – RUMAC Mix



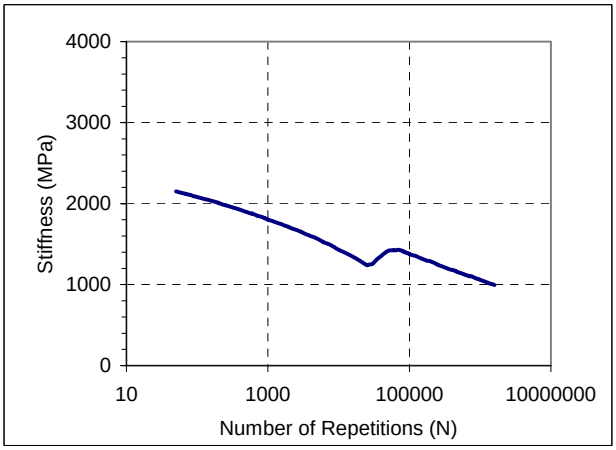
MBG12F Tested at approximately 400 με



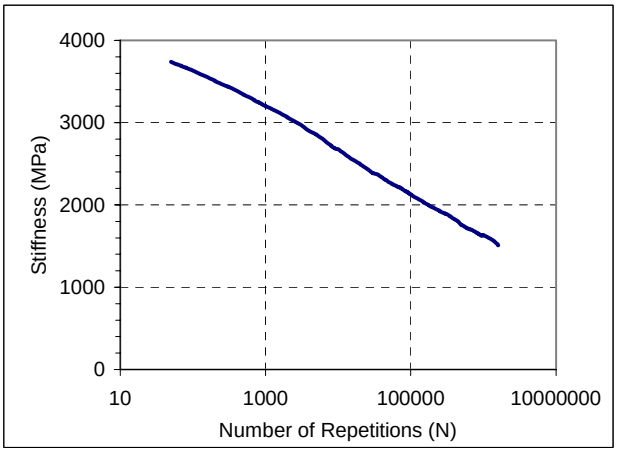
MBG12A Tested at approximately 600 με



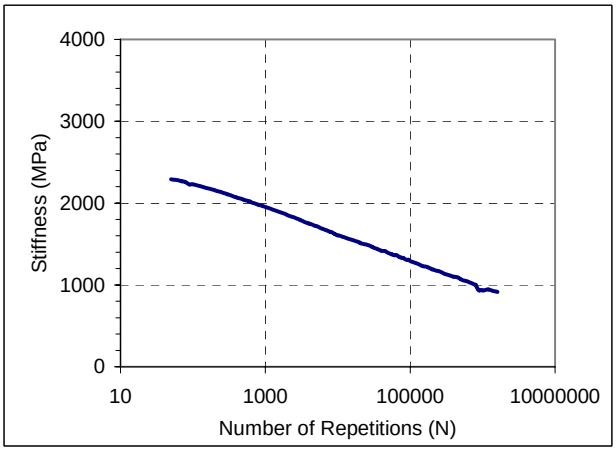
MBG12C Tested at approximately 400 με



MBG12B Tested at approximately 600 με

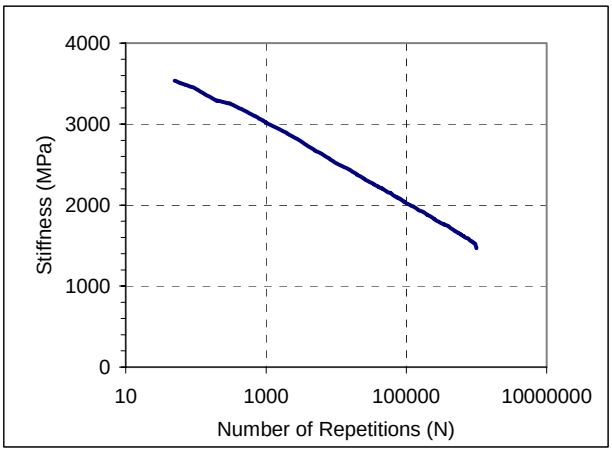


MBG12E Tested at approximately 400 με

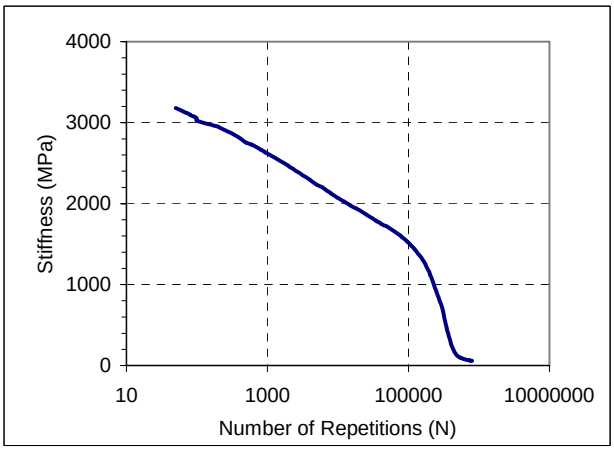


MBG10C Tested at approximately 600 με

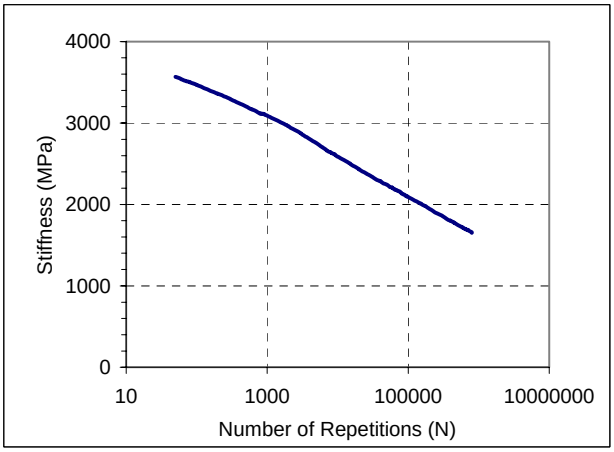
Figure C-3 Stiffness (@ 20°C) vs. Number of Repetitions – MB-G Mix



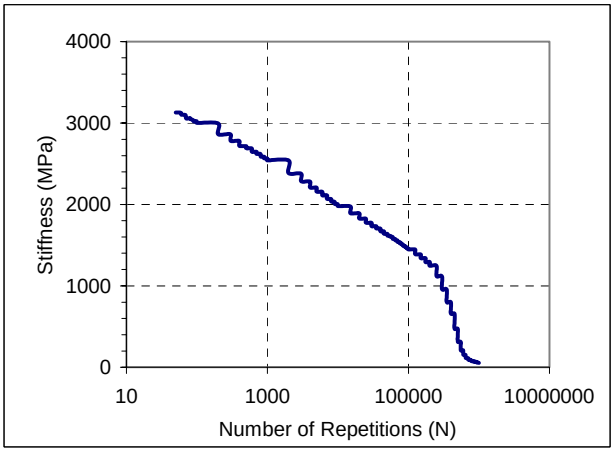
MBD14A Tested at approximately 400 με



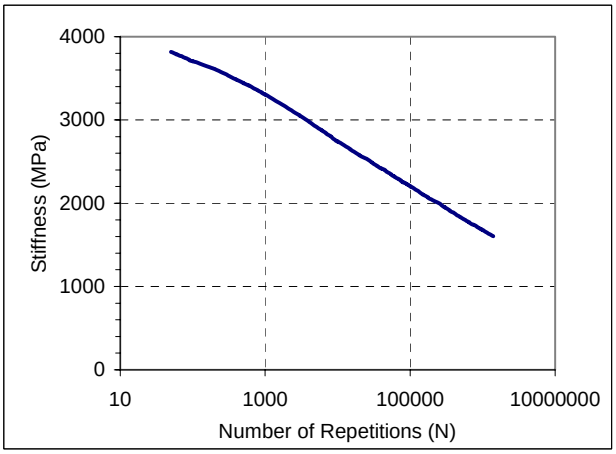
MBD14D Tested at approximately 600 με



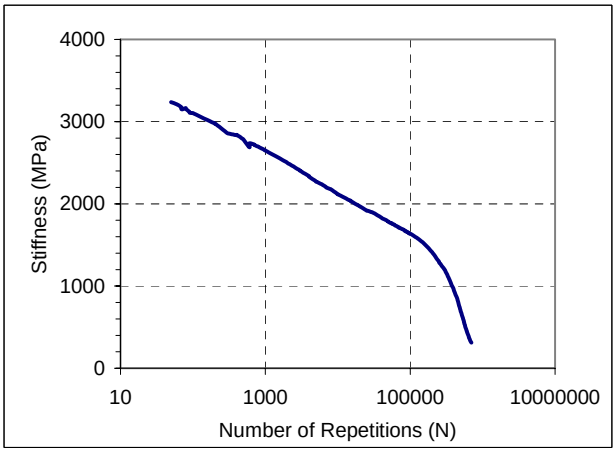
MBD14B Tested at approximately 400 με



MBD15A Tested at approximately 600 με

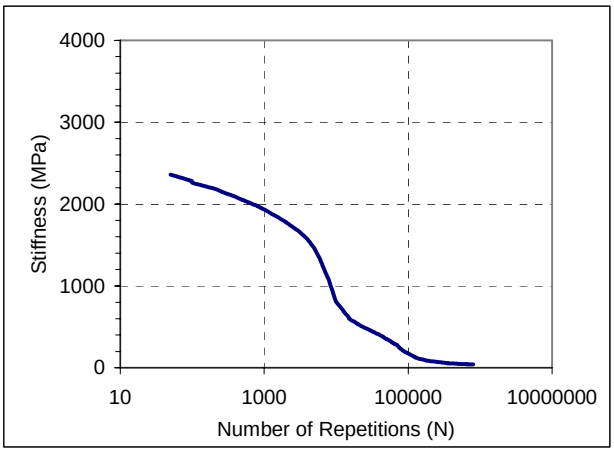


MBD14C Tested at approximately 400 με

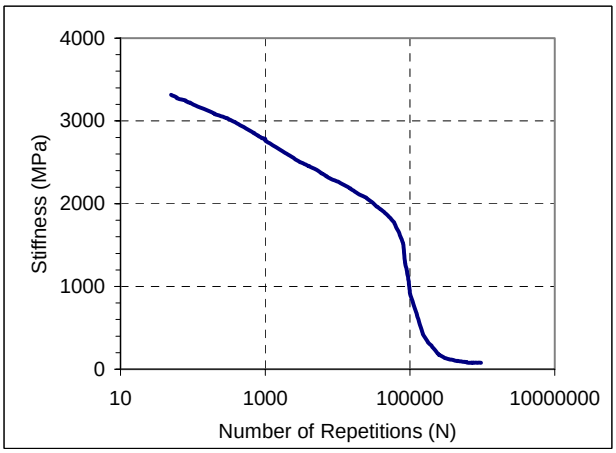


MBD15B Tested at approximately 600 με

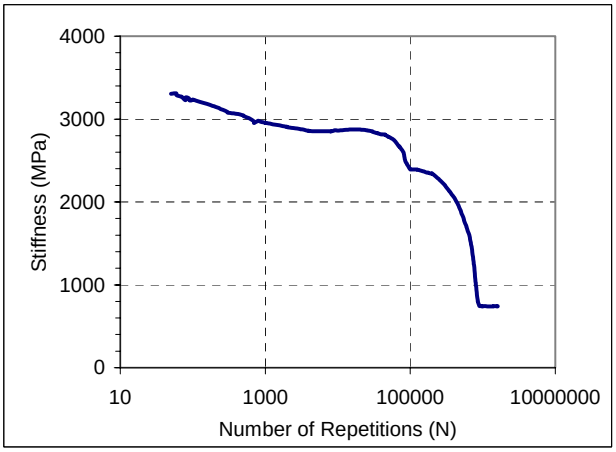
Figure C-4 Stiffness (@ 20°C) vs. Number of Repetitions – MB-D Mix



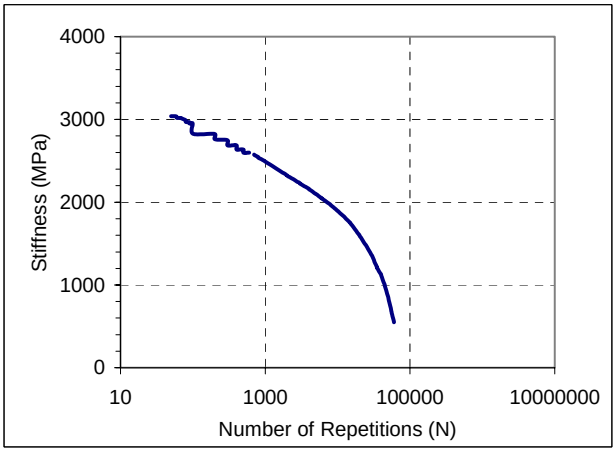
DGA19A Tested at approximately 400 με



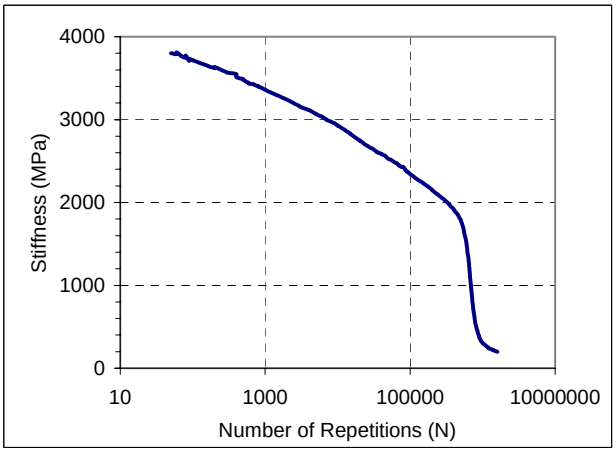
DGA19D Tested at approximately 600 με



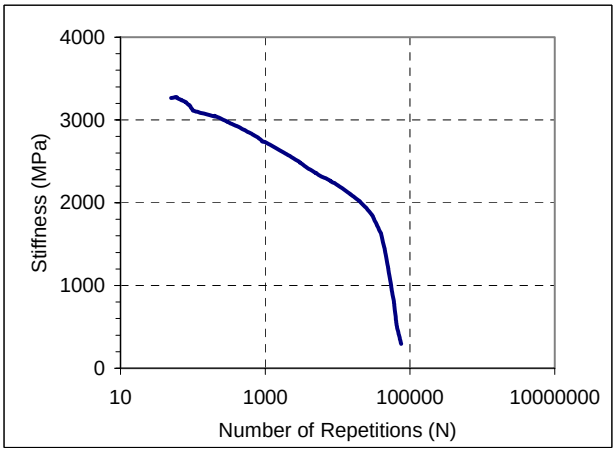
DGA19B Tested at approximately 400 με



DGA20A Tested at approximately 600 με

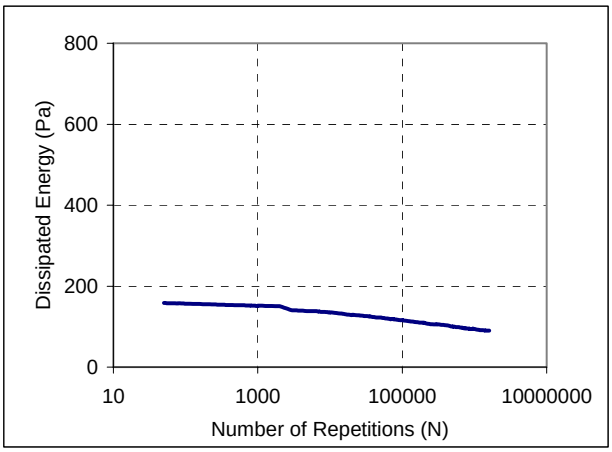


DGA19C Tested at approximately 400 με

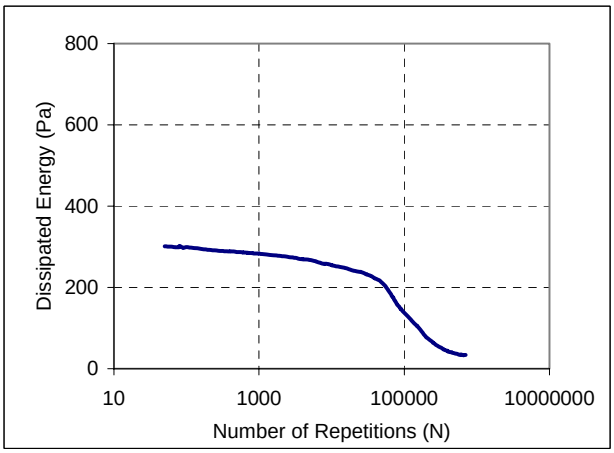


DGA20B Tested at approximately 600 με

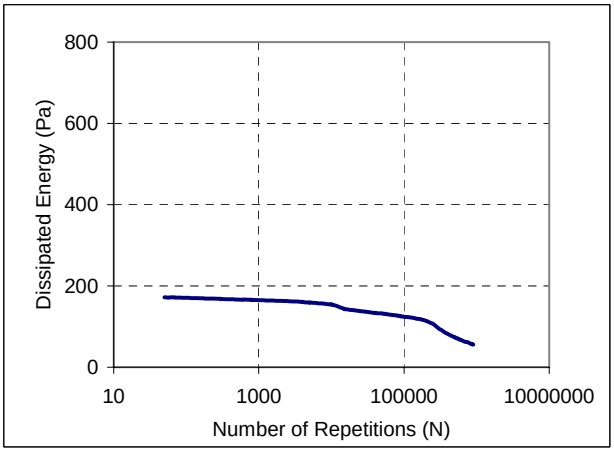
Figure C-5 Stiffness (@ 20°C) vs. Number of Repetitions – DGAC Mix



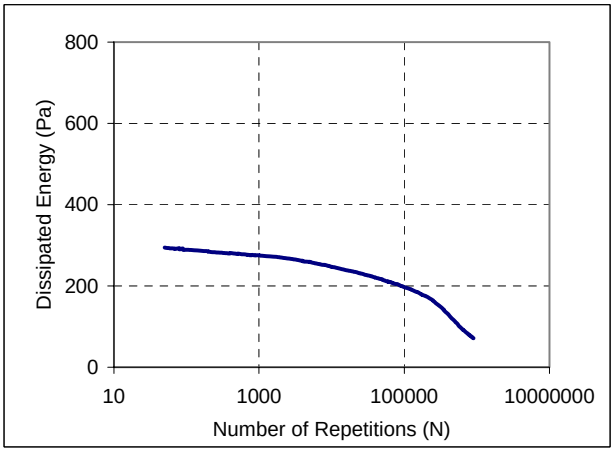
RACG3A Tested at approximately 400 με



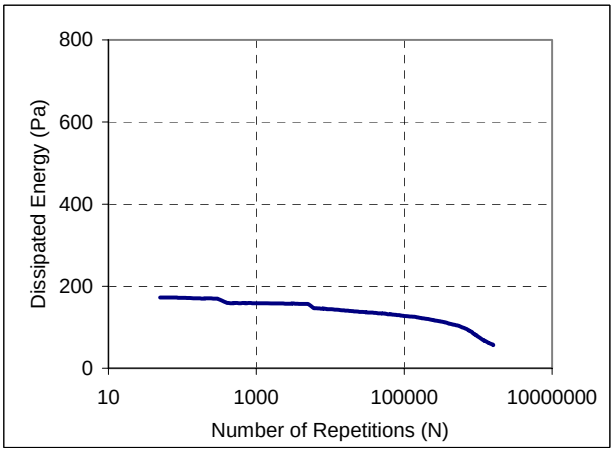
RACG4A Tested at approximately 600 με



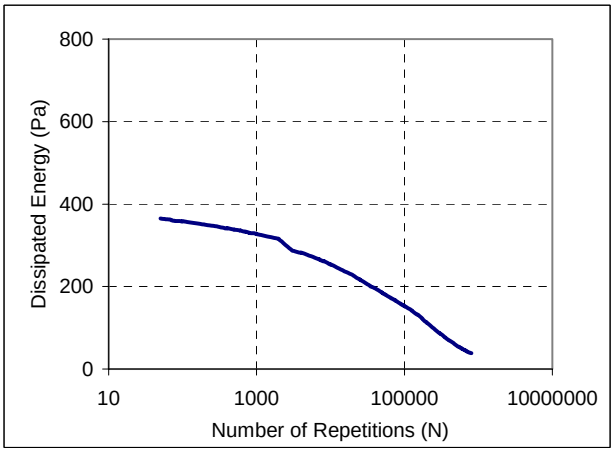
RACG3B Tested at approximately 400 με



RACG4B Tested at approximately 600 με

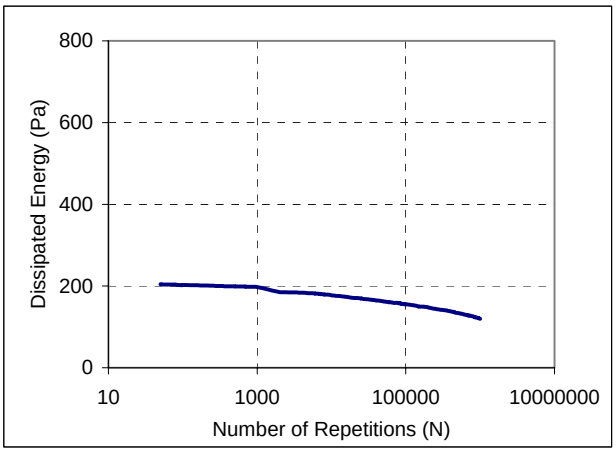


RACG4D Tested at approximately 400 με

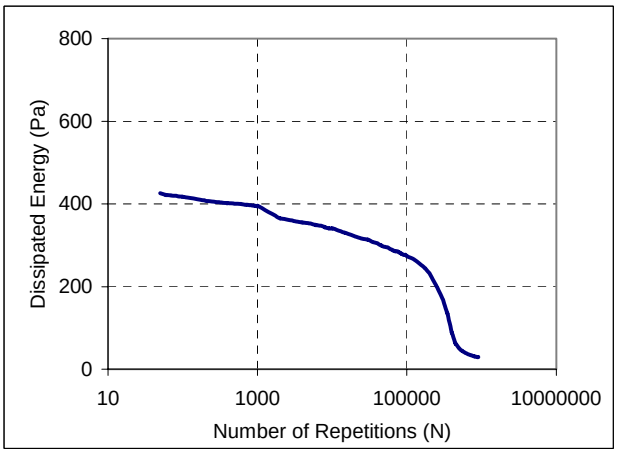


RACG4C Tested at approximately 600 με

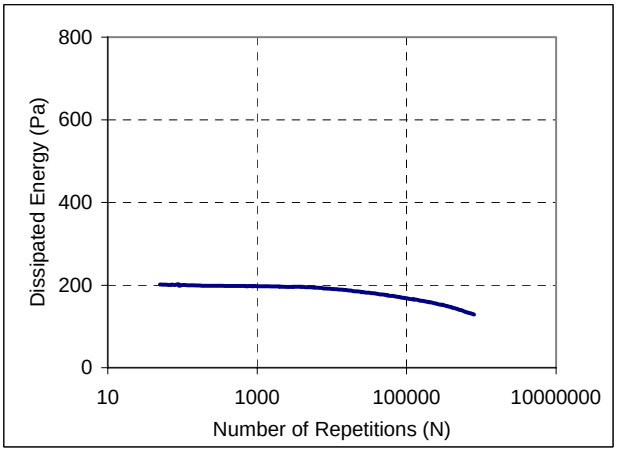
Figure C-6 Dissipated Energy (@ 20°C) vs. Number of Repetitions – RAC-G Mix



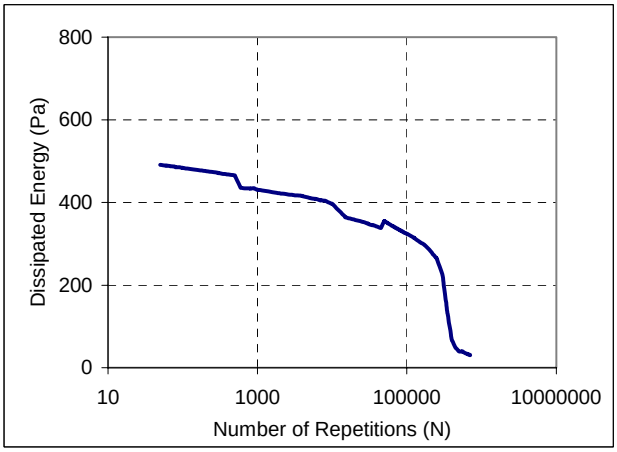
RUMC7A Tested at approximately 400 με



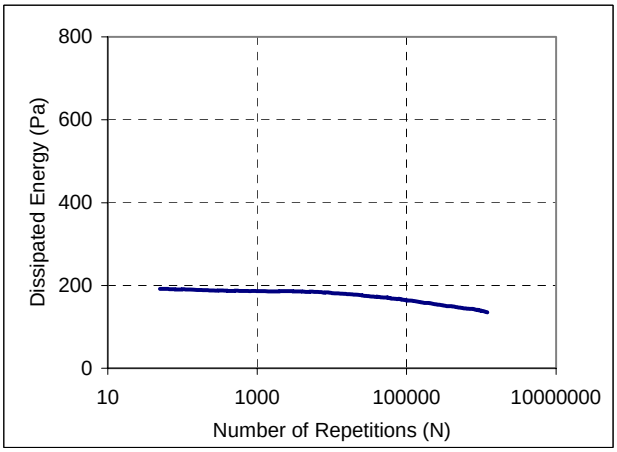
RUMC6B Tested at approximately 600 με



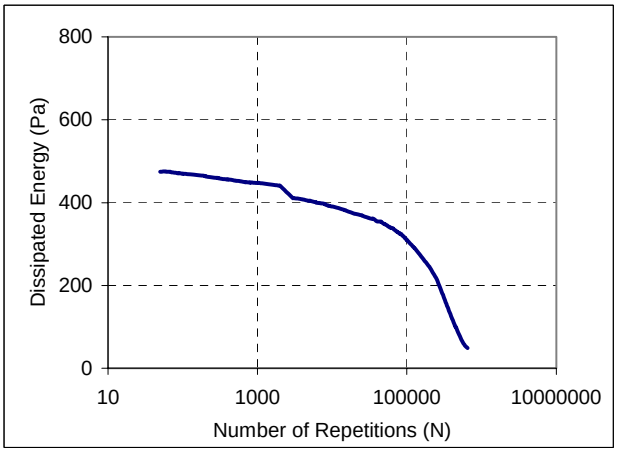
RUMC7B Tested at approximately 400 με



RUMC6C Tested at approximately 600 με

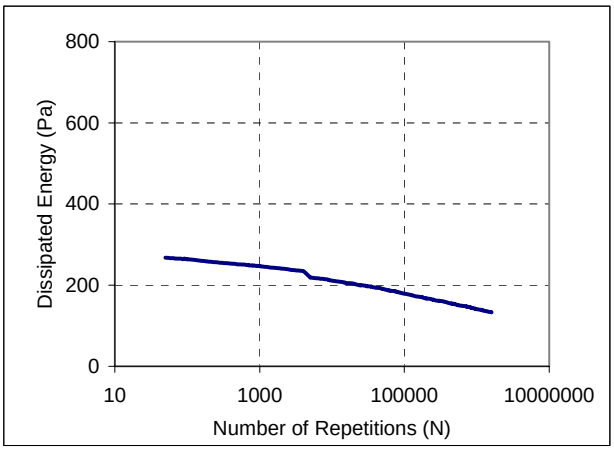


RUMC7C Tested at approximately 400 με

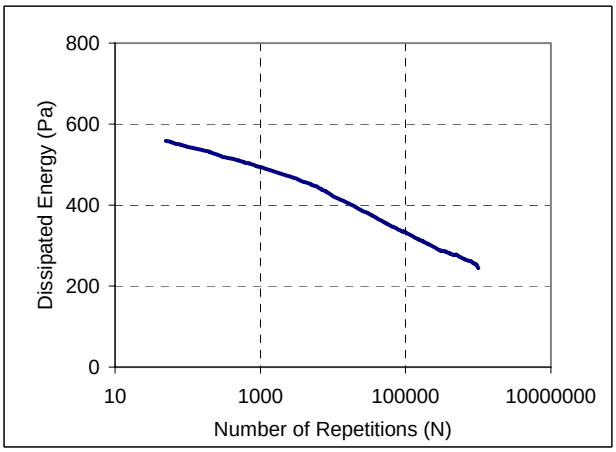


RUMC6D Tested at approximately 600 με

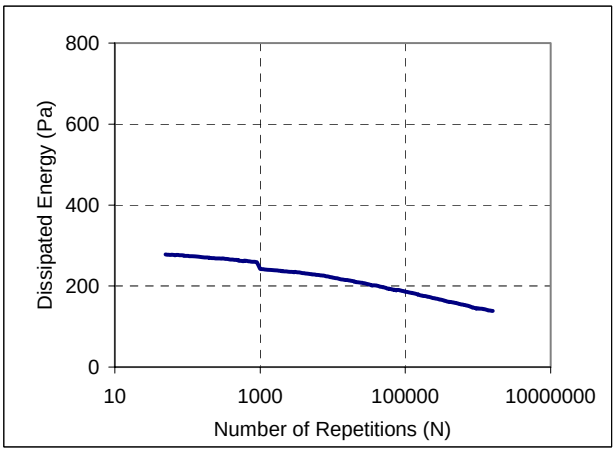
Figure C-7 Dissipated Energy (@ 20°C) vs. Number of Repetitions – RUMAC Mix



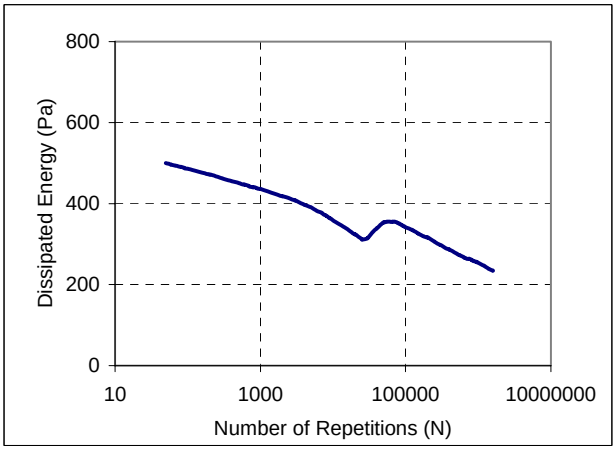
MBG12F Tested at approximately 400 με



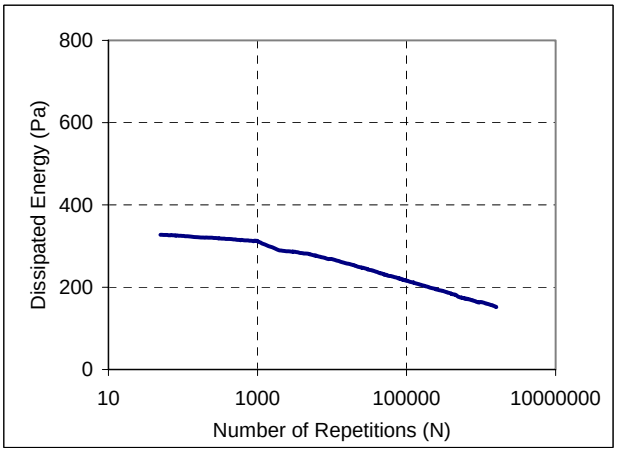
MBG12A Tested at approximately 600 με



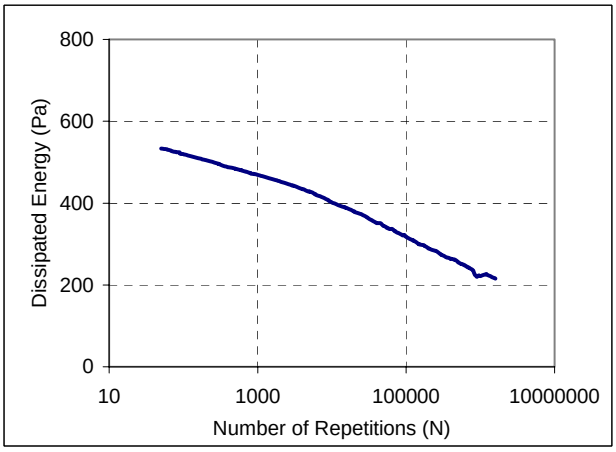
MBG12C Tested at approximately 400 με



MBG12B Tested at approximately 600 με

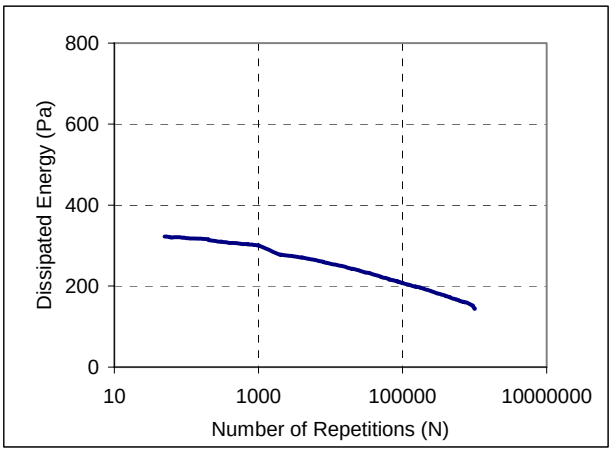


MBG12E Tested at approximately 400 με

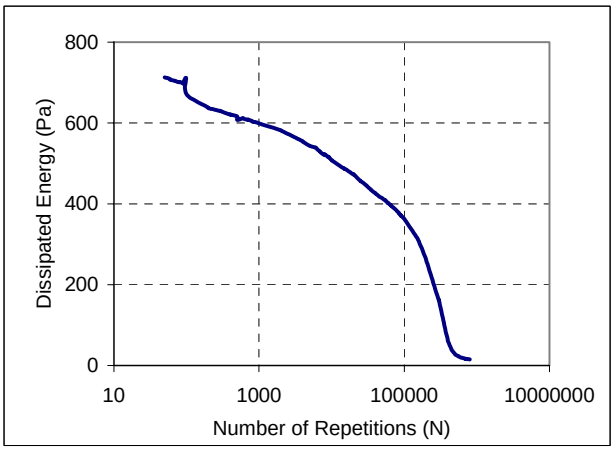


MBG10C Tested at approximately 600 με

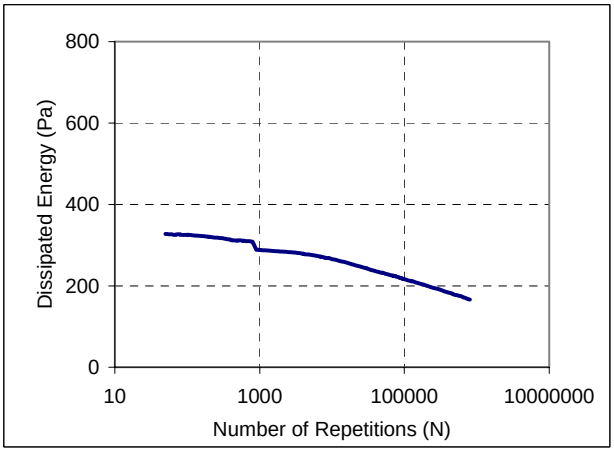
Figure C-8 Dissipated Energy (@ 20°C) vs. Number of Repetitions – MB-G Mix



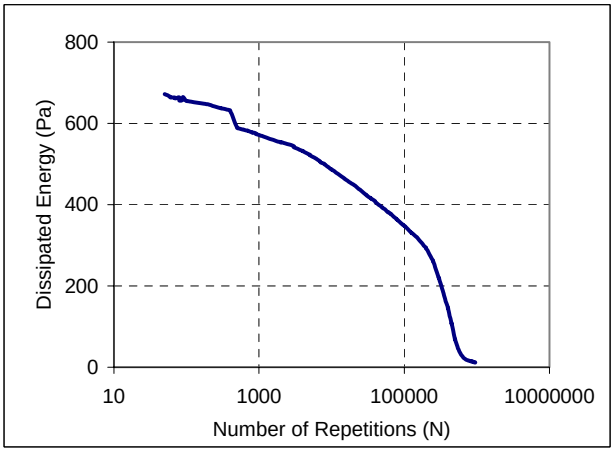
MBD14A Tested at approximately 400 με



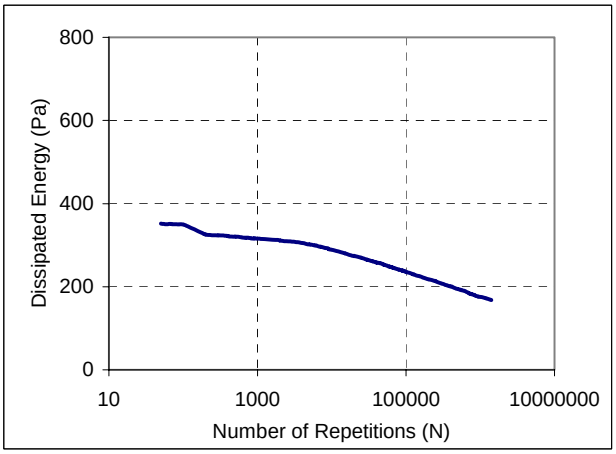
MBD14D Tested at approximately 600 με



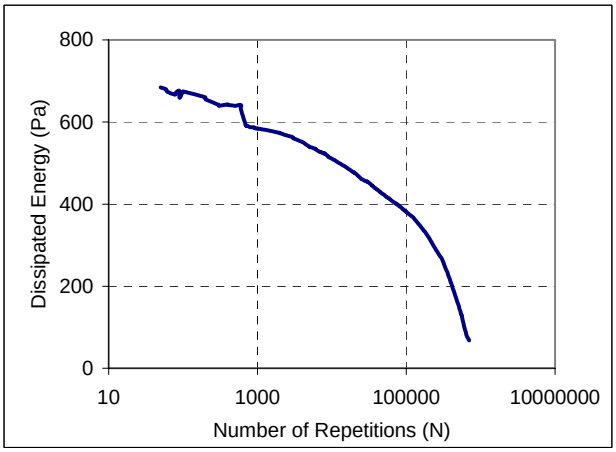
MBD14B Tested at approximately 400 με



MBD15A Tested at approximately 600 με

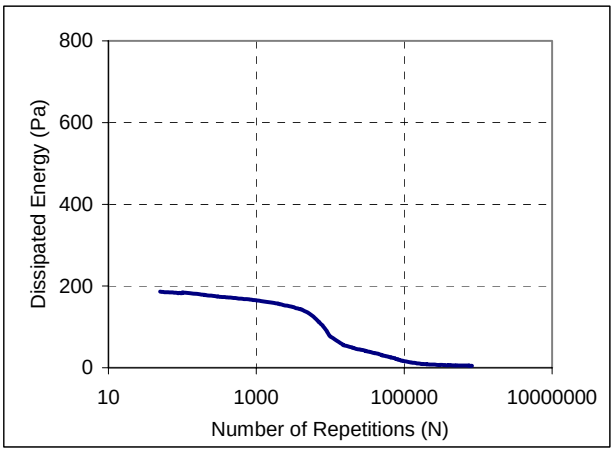


MBD14C Tested at approximately 400 με

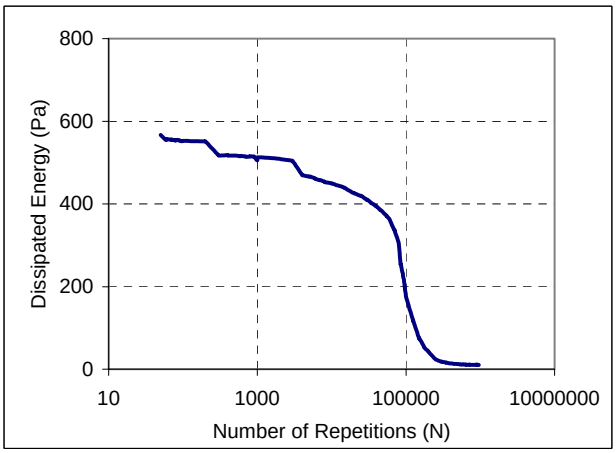


MBD15B Tested at approximately 600 με

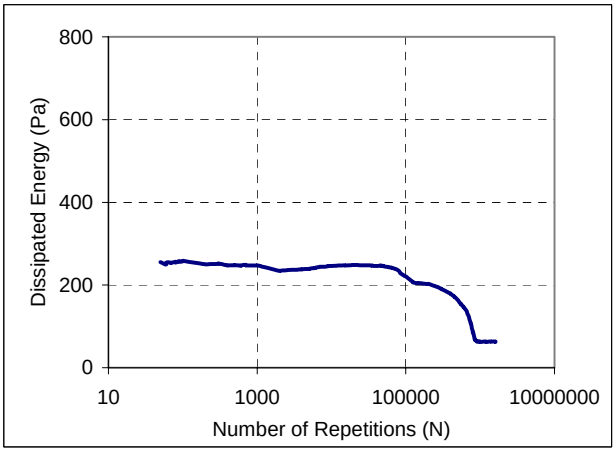
Figure C-9 Dissipated Energy (@ 20°C) vs. Number of Repetitions – MB-D Mix



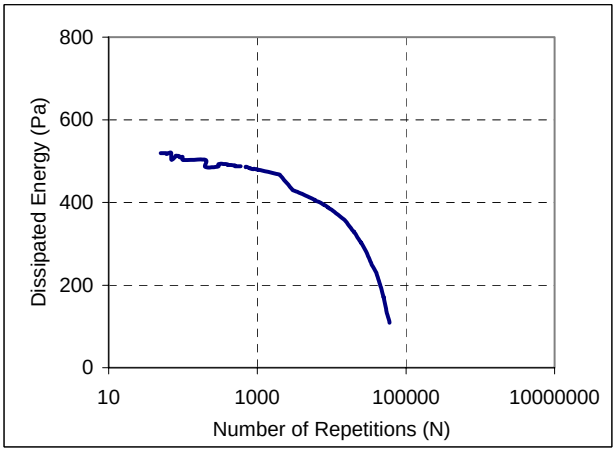
DGA19A Tested at approximately 400 με



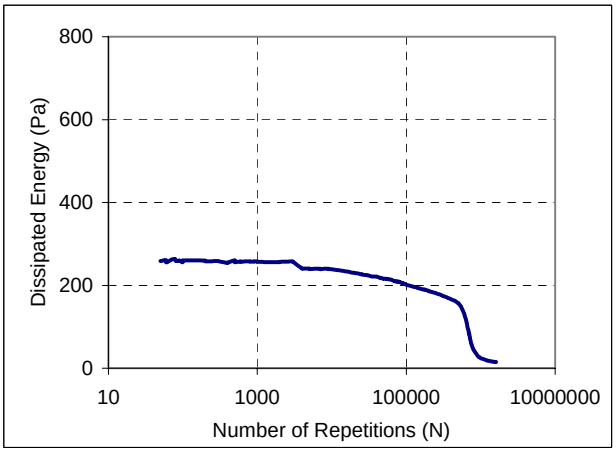
DGA19D Tested at approximately 600 με



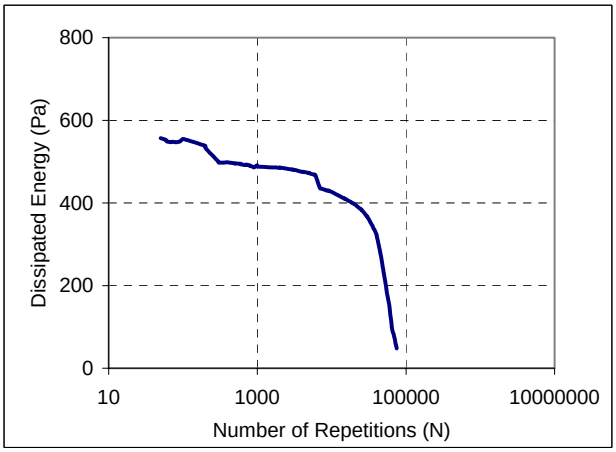
DGA19B Tested at approximately 400 με



DGA20A Tested at approximately 600 με



DGA19C Tested at approximately 400 με



DGA20B Tested at approximately 600 με

Figure C-10 Dissipated Energy (@ 20°C) vs. Number of Repetitions – DGAC Mix

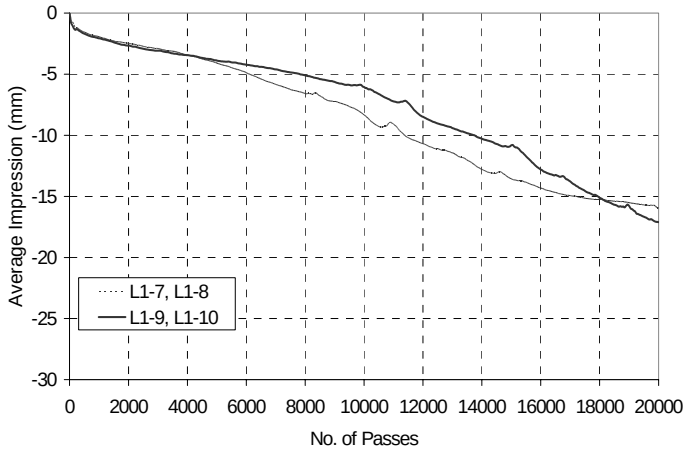
APPENDIX D

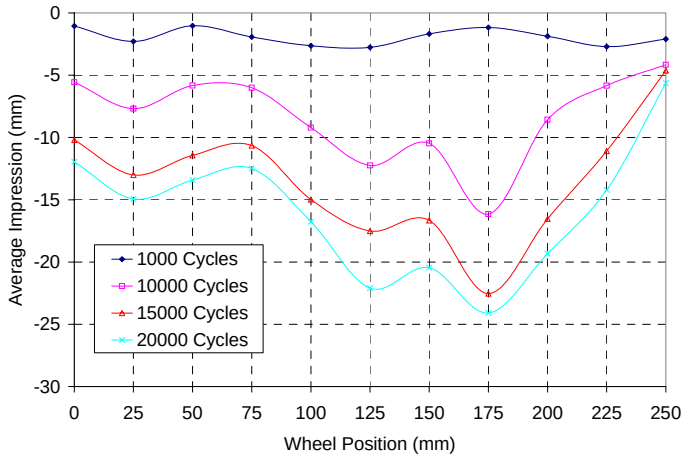
HAMBURG WHEEL TRACKING TEST RESULTS

Table D-1 Measurements of Air Void Content

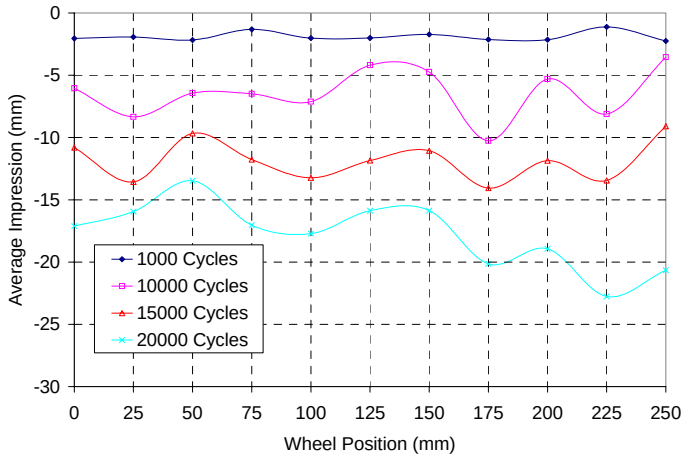
Specimen ID	Dry Mass of specimen in Air (g)	Dry Mass of specimen+ parafilm in Air (g)	Mass of specimen+ parafilm in water (g)	Mass of specimen in water (g)	BSG	Air Voids (%)	Height (mm)
STA132-L1-7	3113	3118	1745	1777	2.330	5.28	76
STA132-L1-8	3034	3037	1704	1727	2.321	5.64	78
STA132-L1-9	3047	3052	1715	1734	2.321	5.67	76
STA132-L1-10	3137	3040	1762	1784	2.319	5.75	75
STA132-L2-7	2418	2421	1343	1379	2.327	5.40	60
STA132-L2-8	2809	2814	1569	1607	2.337	5.00	68
STA132-L2-9	2444	2447	1369	1393	2.325	5.47	57
STA132-L2-10	2629	2633	1463	1496	2.320	5.68	63
STA132-L3-7	2833	2836	1580	1613	2.322	5.60	69
STA132-L3-8	3139	3143	1734	1787	2.322	5.62	78
STA132--L3-9	3027	3031	1686	1720	2.316	5.85	74
STA132-L3-10	2962	2965	1644	1679	2.309	6.15	72
STA132-L4-8	3236	3239	1856	1879	2.385	3.06	78
STA132-L4-9	3378	3382	1932	1953	2.371	3.64	80
STA132-L4-7	2972	2977	1693	1716	2.366	3.81	74
STA132-L4-10	2870	2876	1633	1657	2.366	3.82	71

Rice Gravity Value = 2.460



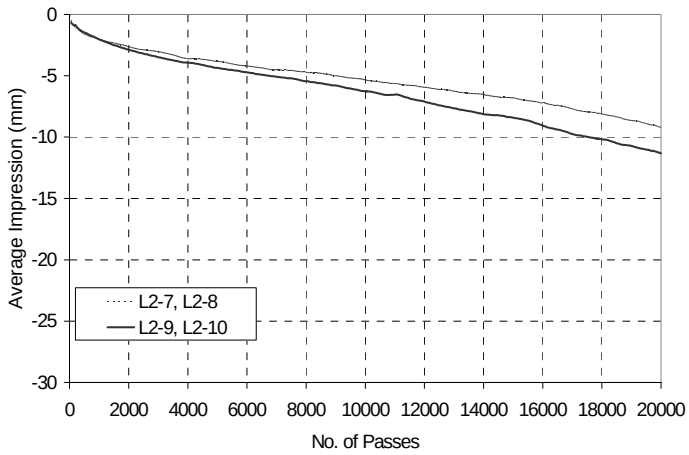


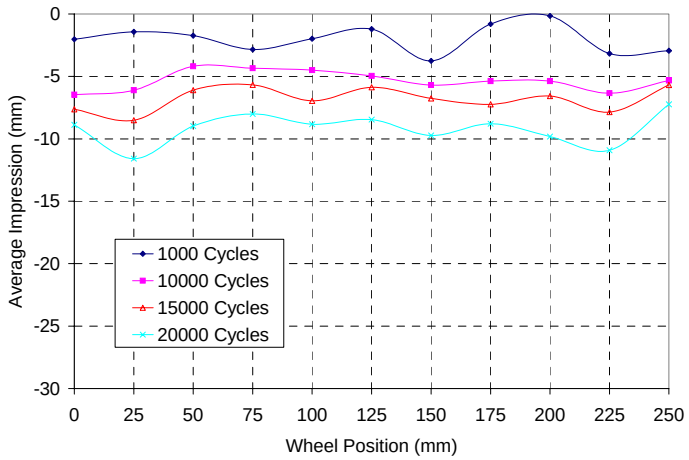
L1-7 and L1-8



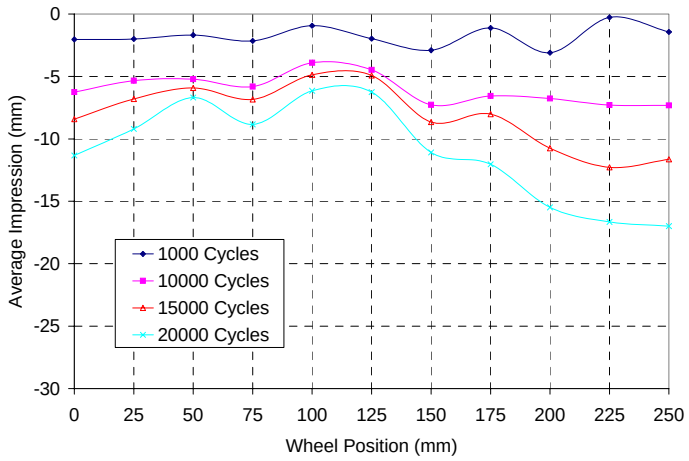
L1-9 and L1-10

Figure D-1 Average Deformation for DGAC Cores Taken at Stat132 – Samples L1 7-10



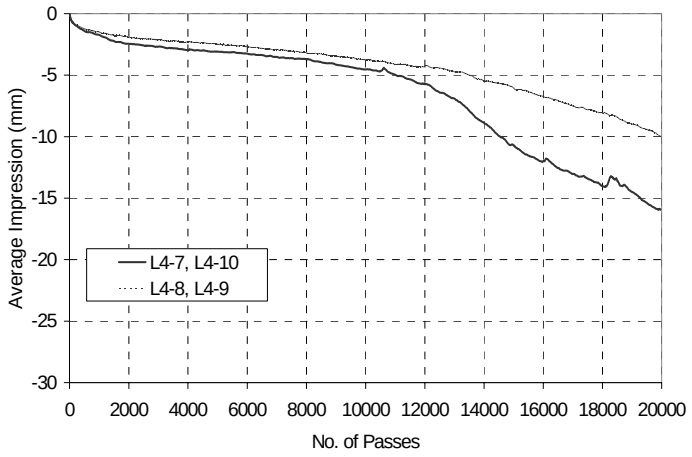


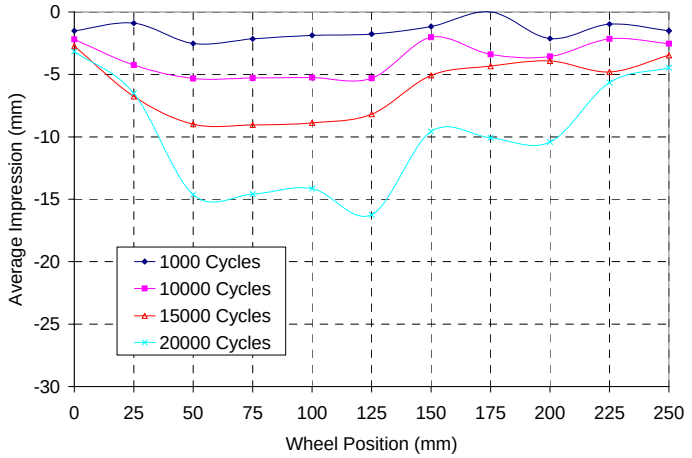
L2-7 and L2-8



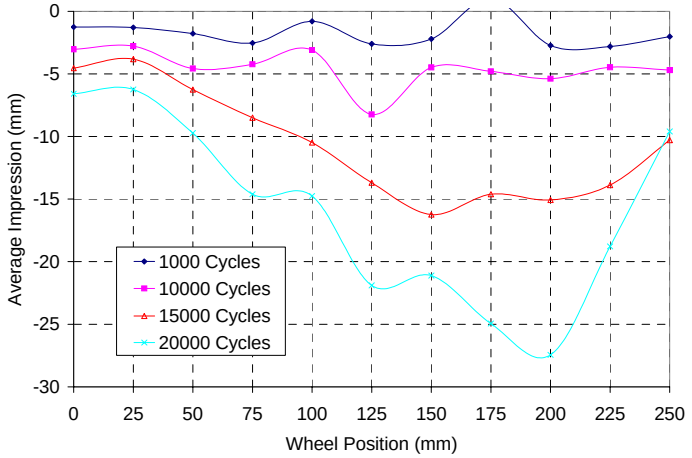
L2-9 and L2-10

Figure D-2 Average Deformation for DGAC Cores Taken at Stat132 – Samples L2 7-10





L4-8, L4-9

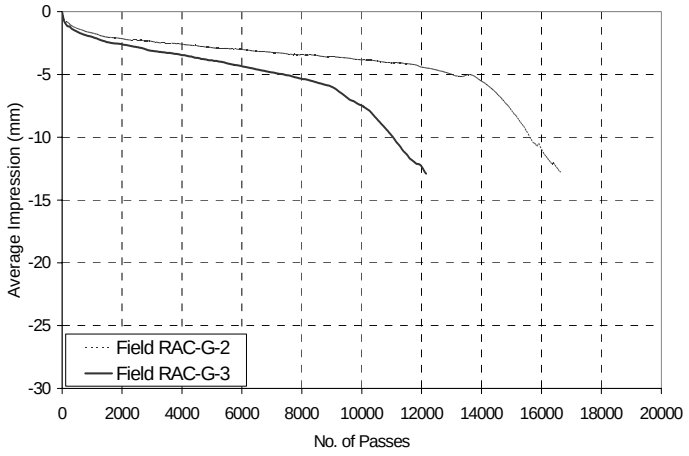


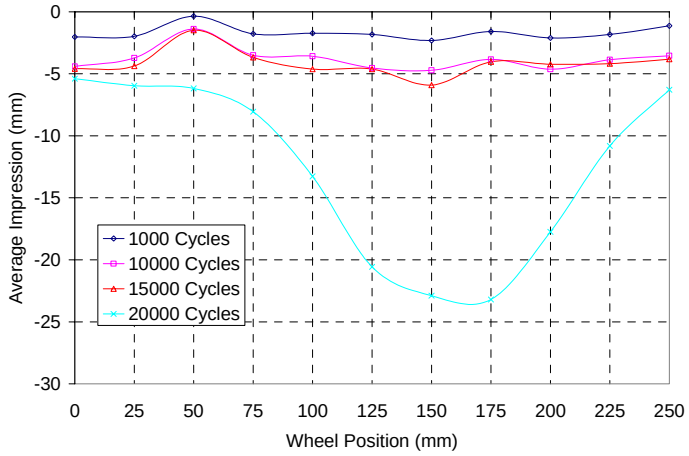
L4-7, L4-10

Figure D-3 Average Deformation for DGAC Cores Taken at Stat132 – Samples L4 7-10

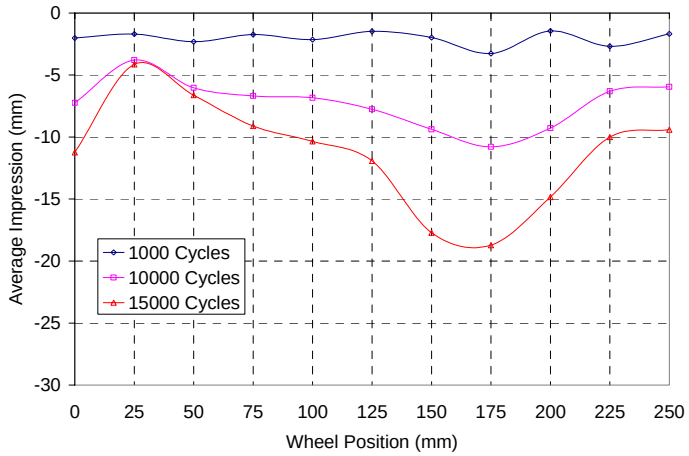
Table D-2 Air Void Content Measured from Field Specimens

From Field	Mass in Water (g)	Surface Dry Mass in Air (g)	Mass (g) in Air after Drying in Oven at 50°C	Rice Gravity	Air Void Content (%)	Length (mm)	Width (mm)	Height (mm)
RAC-G-2	8,283	14,930.0	14,870.3	2.384	6.16	332	252	76
RAC-G-3	7,908	14,343.9	14,271.8	2.384	6.98	328	256	76
RUMAC-G-6A	5,720	10,215.4	10,206.9	2.391	5.04	305	198	75
RUMAC-G-6B	5,868	10,511.3	10,506.1	2.391	5.37	306	199	78
MB-D-13	8,869	15,452.0	15,431.4	2.456	4.56	330	254	79
MB-D-14	9,251	15,895.5	15,889.4	2.456	2.63	332	261	79
MB-G-11	9,128	15,694.2	15,694.4	2.423	1.35	333	261	76
MB-G-2	8,678	15,190.3	15,178.1	2.423	3.81	331	258	78
DGAC-17	8,775	15,308.2	15,291.6	2.460	4.85	330	260	79
DGAC-20	8,425	14,956.0	14,923.9	2.460	7.11	332	261	78



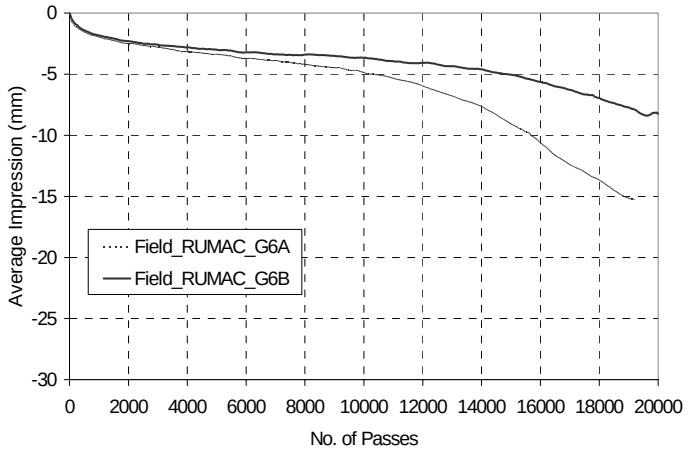


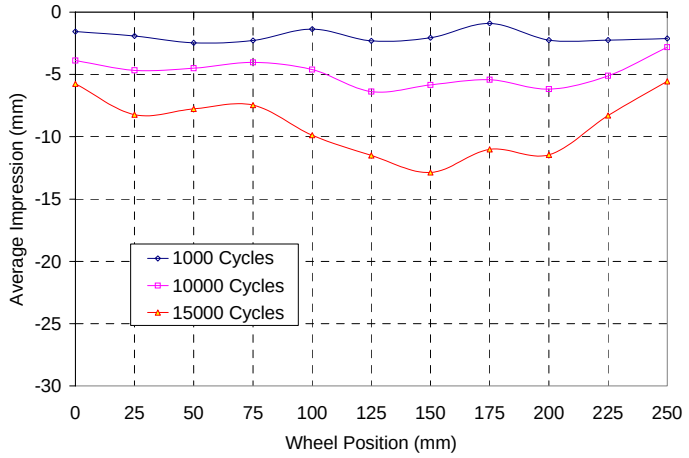
RAC-G2



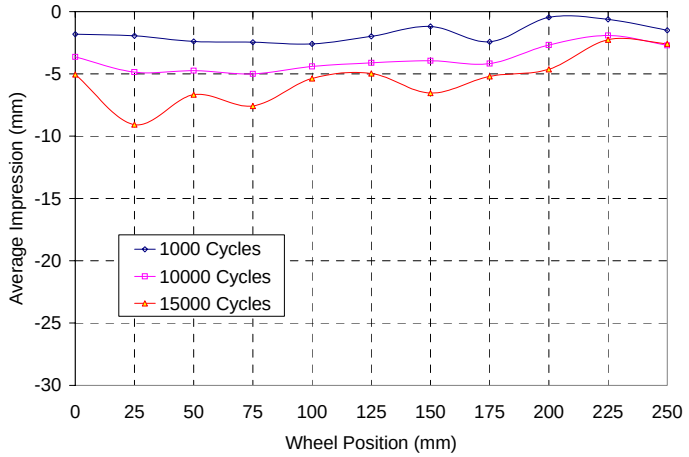
RAC-G3

Figure D-4 Average Deformation for RAC-G FMFC Mix



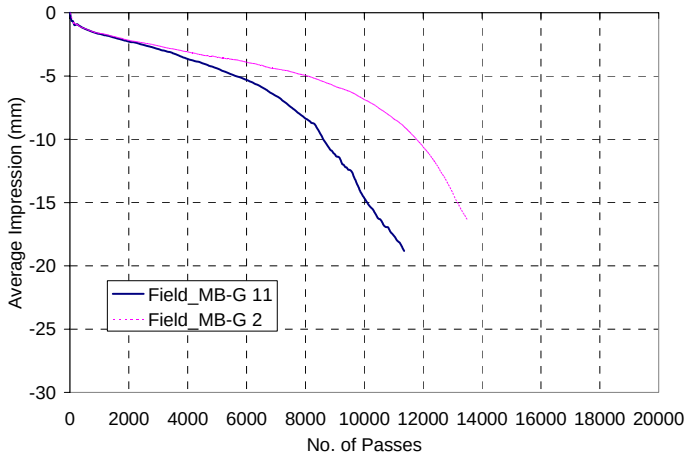


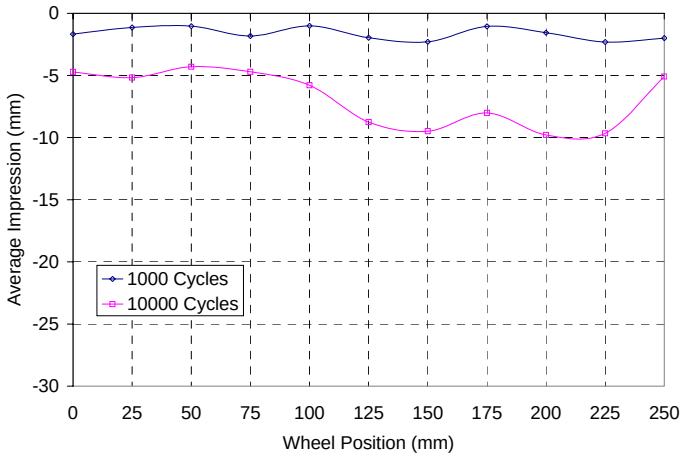
RUMAC-6A



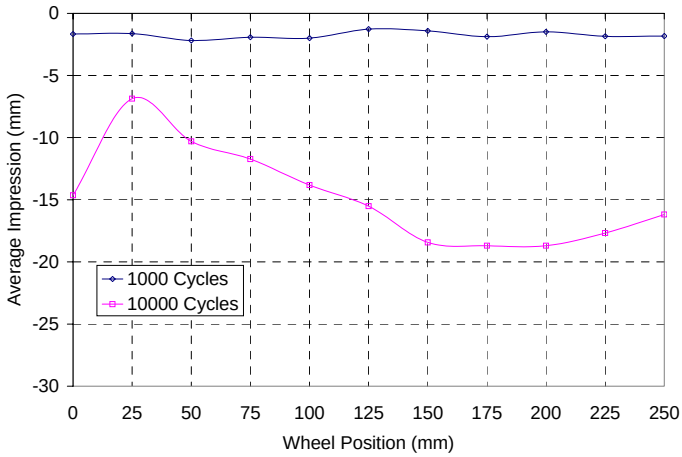
RUMAC-6B

Figure D-5 Average Deformation for RUMAC FMFC Mix



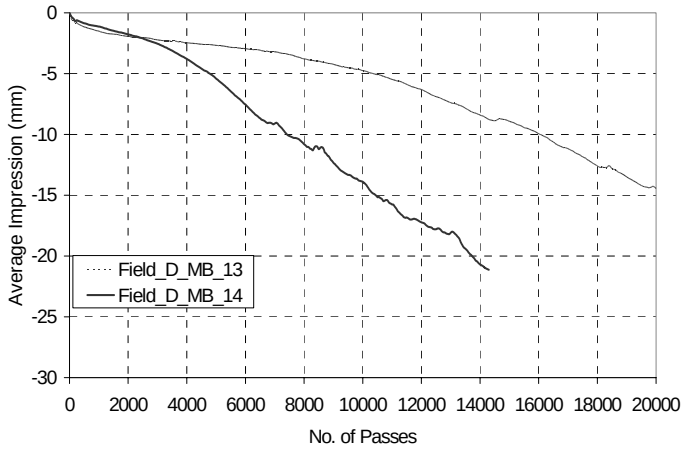


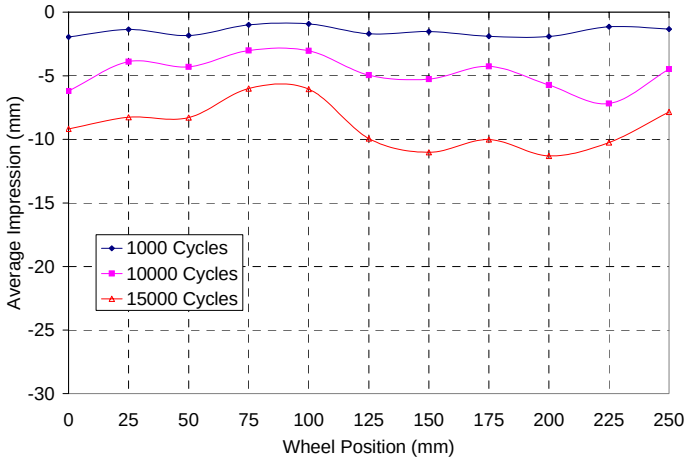
MB-G 2



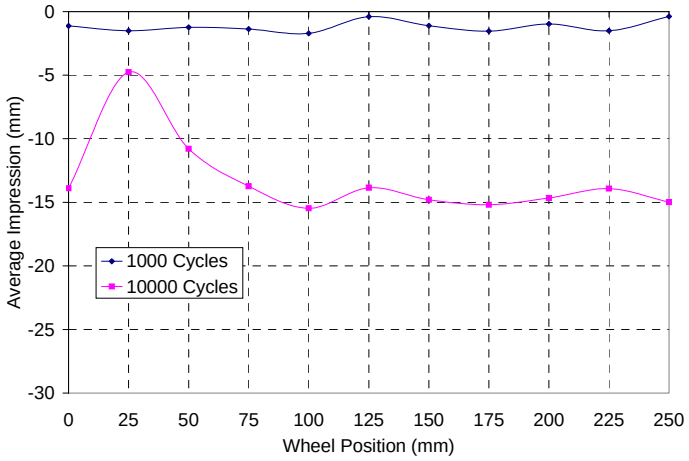
MB-G 11

Figure D-6 Average Deformation for MB-G FMFC Mix



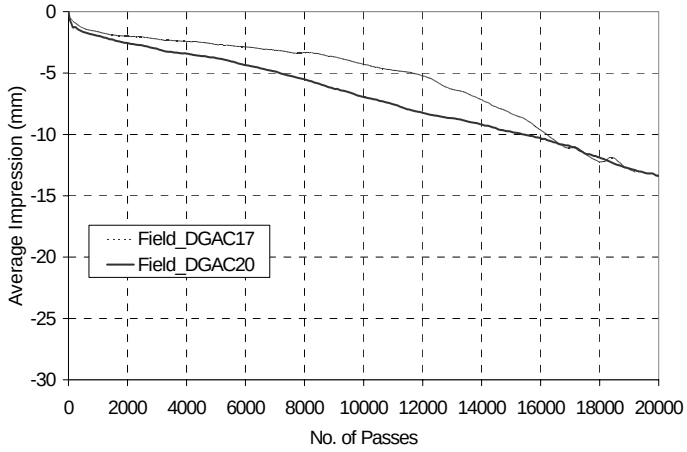


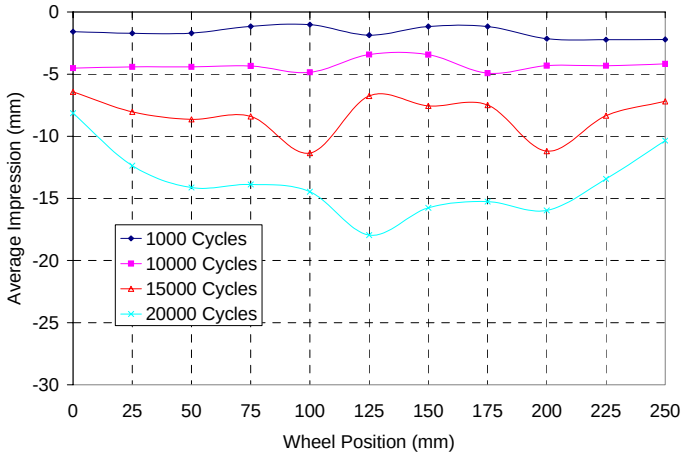
MB-D13



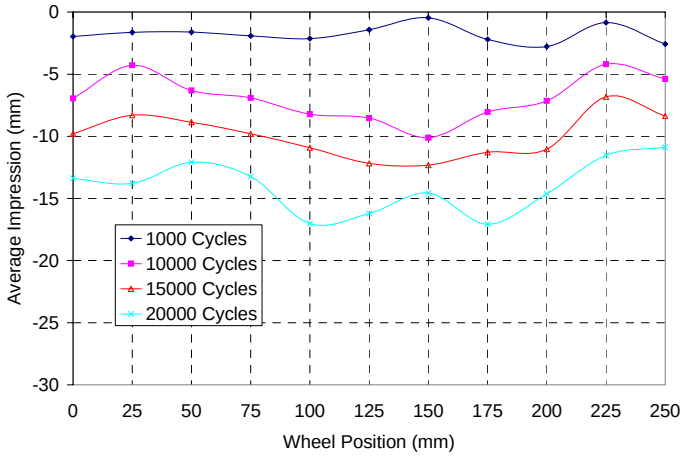
MB-D14

Figure D-7 Average Deformation for MB-D FMFC Mix





DGAC 17

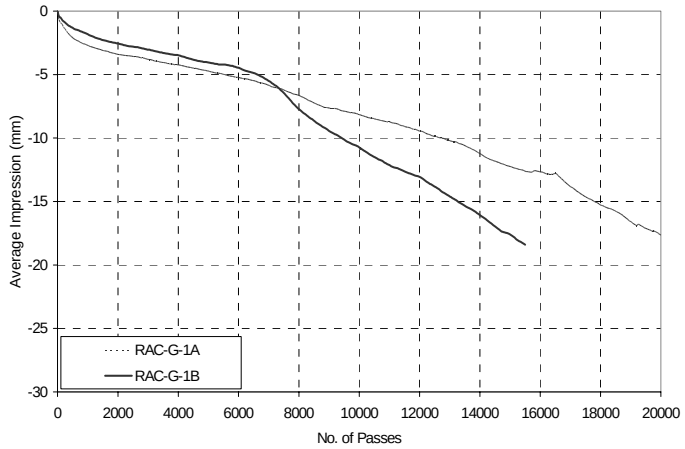


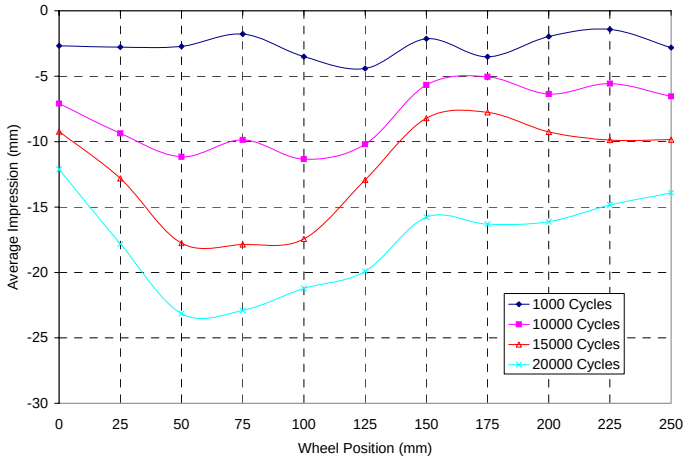
DGAC 20

Figure D-8 Average Deformation for DGAC FMFC Mix

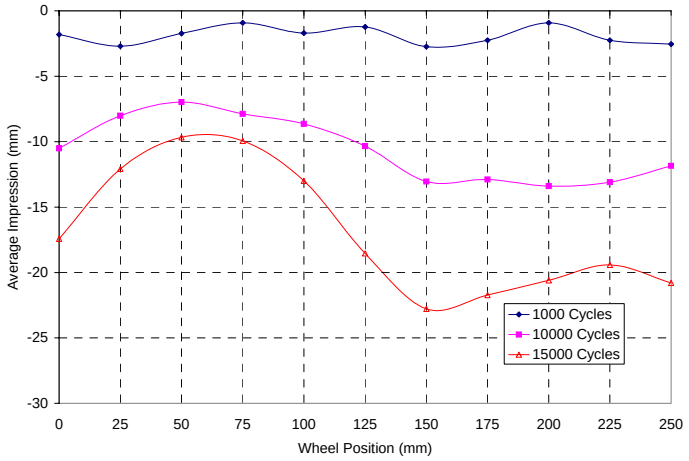
Table D-3 Air Void Content Measured from Lab Mixed Lab Compacted Specimens

Specimen	Mass in Water (g)	Surface Dry Mass in Air (g)	Mass (g) in Air after Drying in Oven at 50°C	Rice Gravity	Air Void Content (%)	Length (mm)	Width (mm)	Height (mm)
RUMAC-G-1A	7,524	13486.2	13414.0	2.391	5.90	317	232	80
RUMAC-G-1B	7,610	13638.1	13578.3	2.391	5.79	317	233	80
D-MB-1A	8,123	14301.5	14229.1	2.456	6.23	320	242	80
D-MB-1B	8,226	14470.9	14430.7	2.456	5.91	320	243	80
RAC-G-1A	7,862	14166.7	14065.0	2.384	6.42	319	240	82
RAC-G-1B	7,733	13982.0	13873.5	2.384	6.87	321	240	83
G-MB-1A	8,033	14286.4	14231.3	2.423	6.08	323	243	80
G-MB-1B	8,085	14304.4	14249.1	2.423	5.44	321	242	80
RUMAC-G-2A	8,117	14418.1	14363.3	2.391	4.66	321	241	81
RUMAC-G-2B	8,019	14214.0	14172.5	2.391	4.32	322	242	81



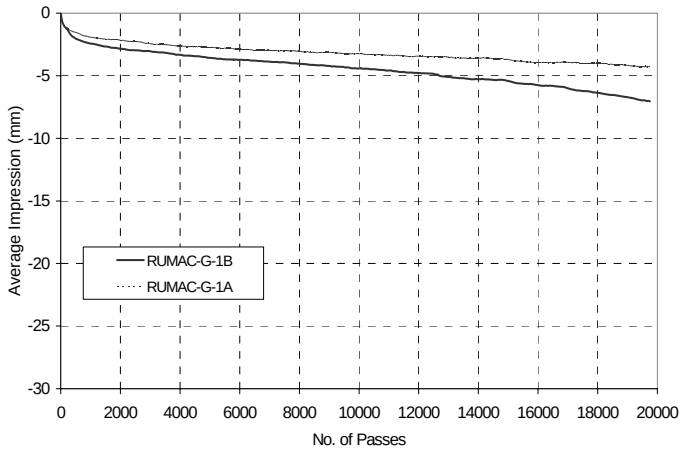


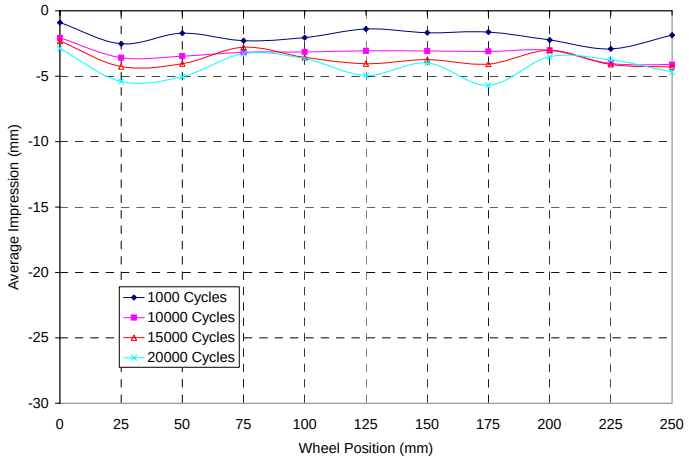
RAC-G 1A



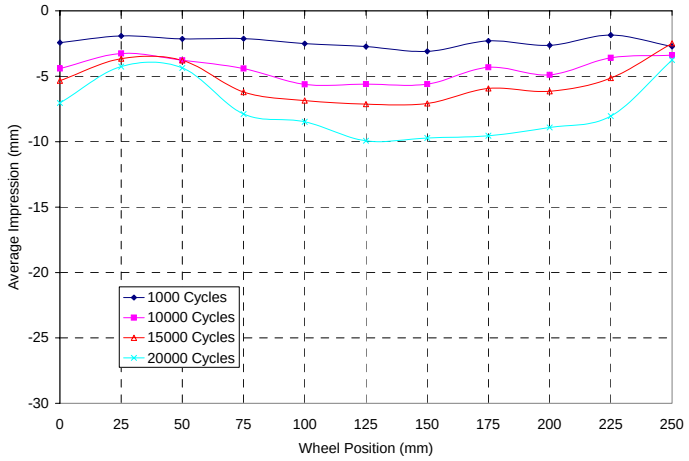
RAC-G 1B

Figure D-9 Average Deformation at Various Wheel Positions – RAC-G FMLC Mix



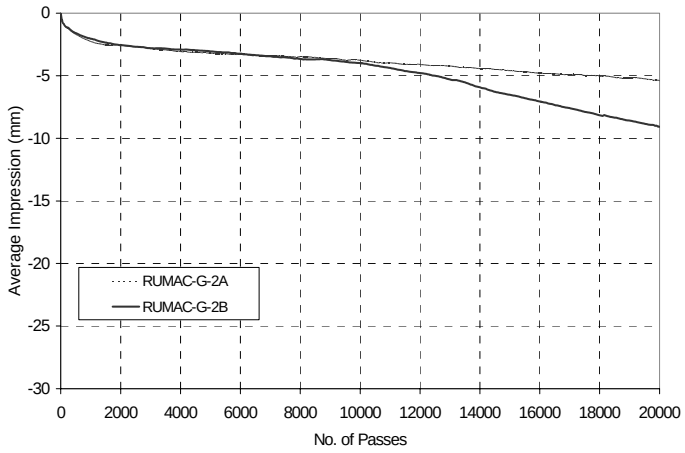


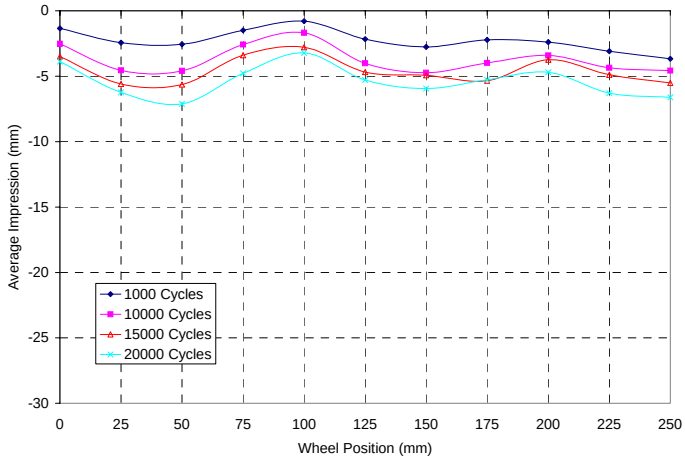
RUMAC 1A



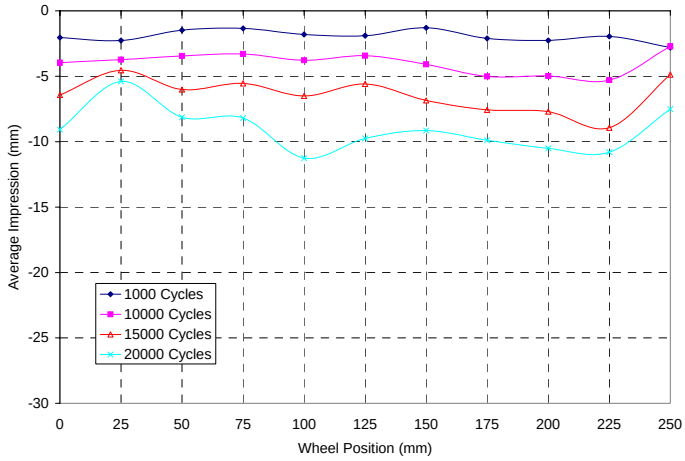
RUMAC 1B

Figure D-10 Average Deformation at Various Wheel Positions – RUMAC FMLC Mix Batch-1



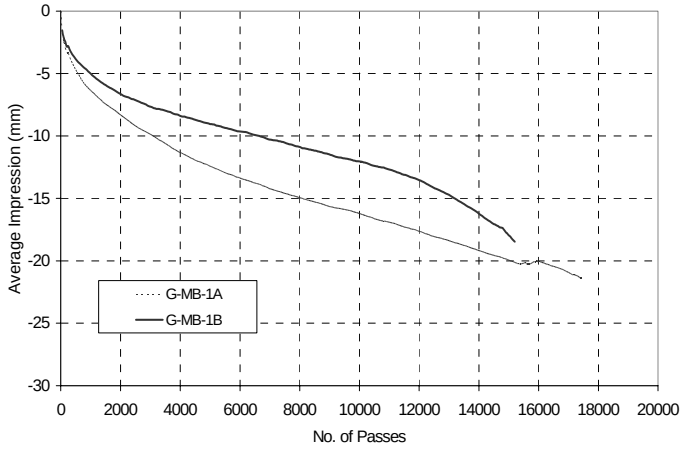


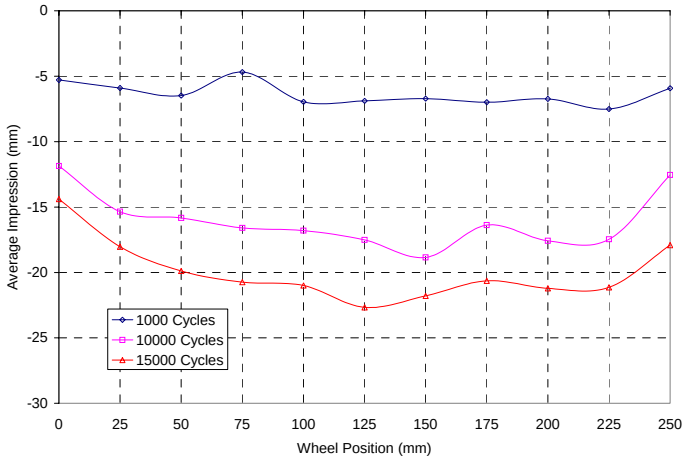
RUMAC 2A



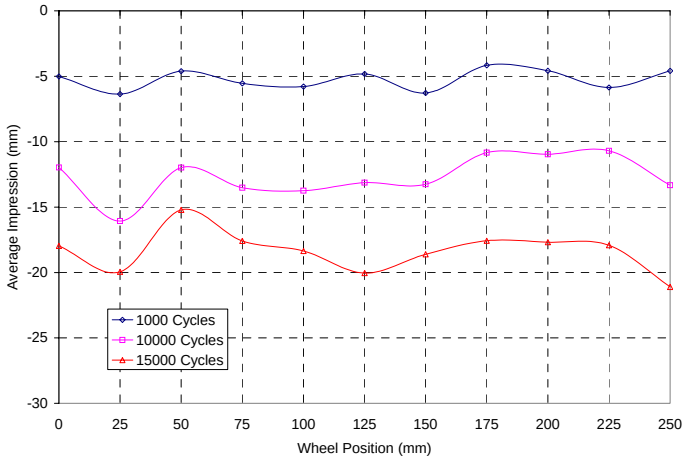
RUMAC 2B

Figure D-11 Average Deformation at Various Wheel Positions – RUMAC FMLC Mix Batch-2



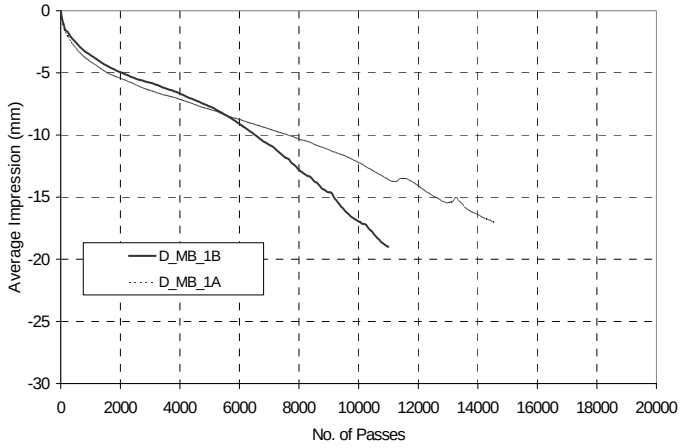


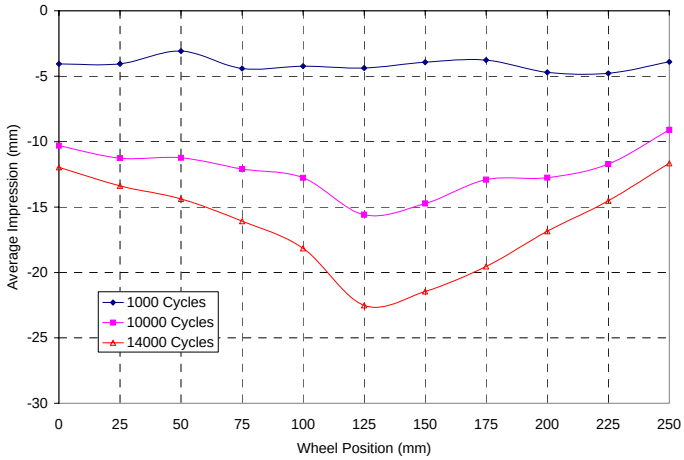
MB-G 1A



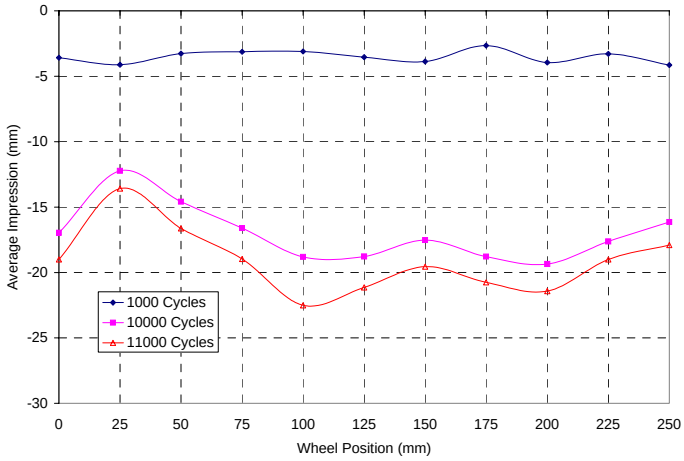
MB-G 1B

Figure D-12 Average Deformation at Various Wheel Positions – MB-G FMLC Mix





MB-D 1A



MB-D 1B

Figure D-13 Average Deformation at Various Wheel Positions – MB-D FMLC Mix

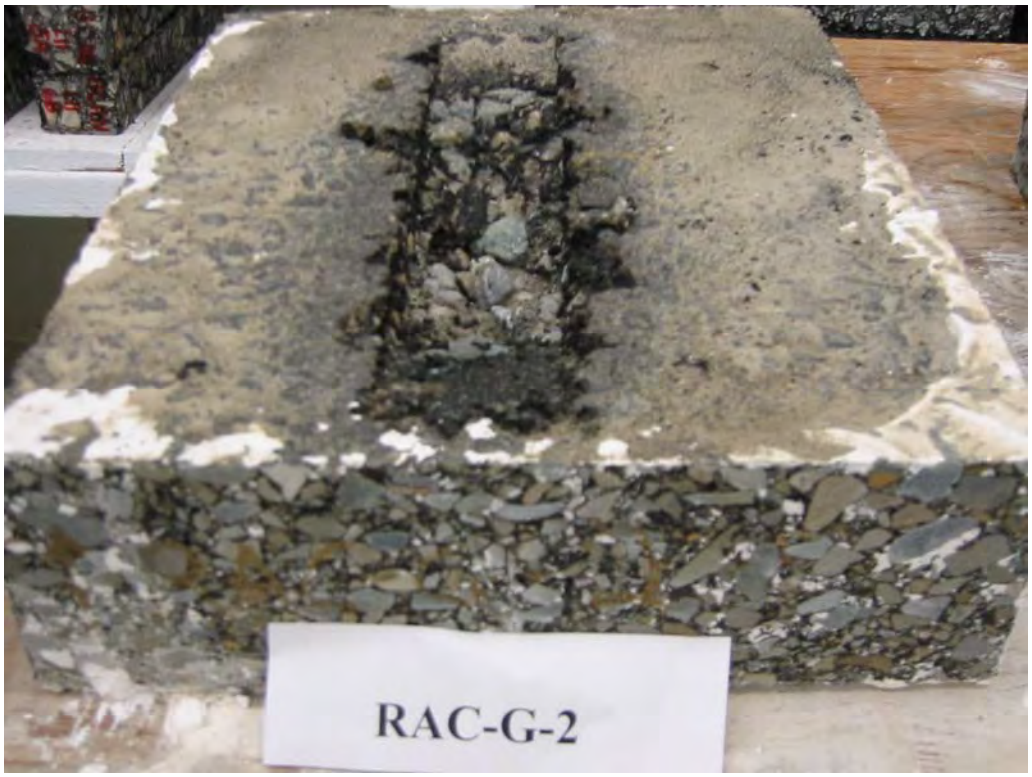


Figure D-14 FMFC RAC-G Mix

Figure D-15 FMLC RAC-G Mix

Figure D-16 FMFC RUMAC Mix

Figure D-17 FMLC RUMAC Mix

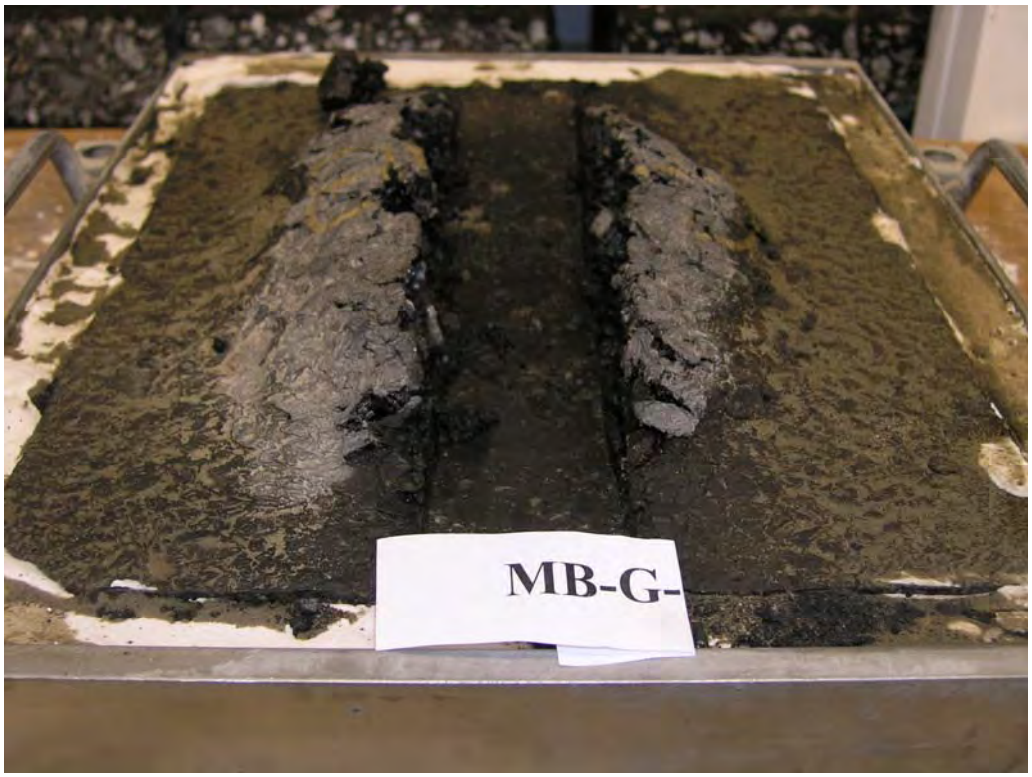


Figure D-18 FMFC MB-G Mix

Figure D-19 FMLC MB-G Mix

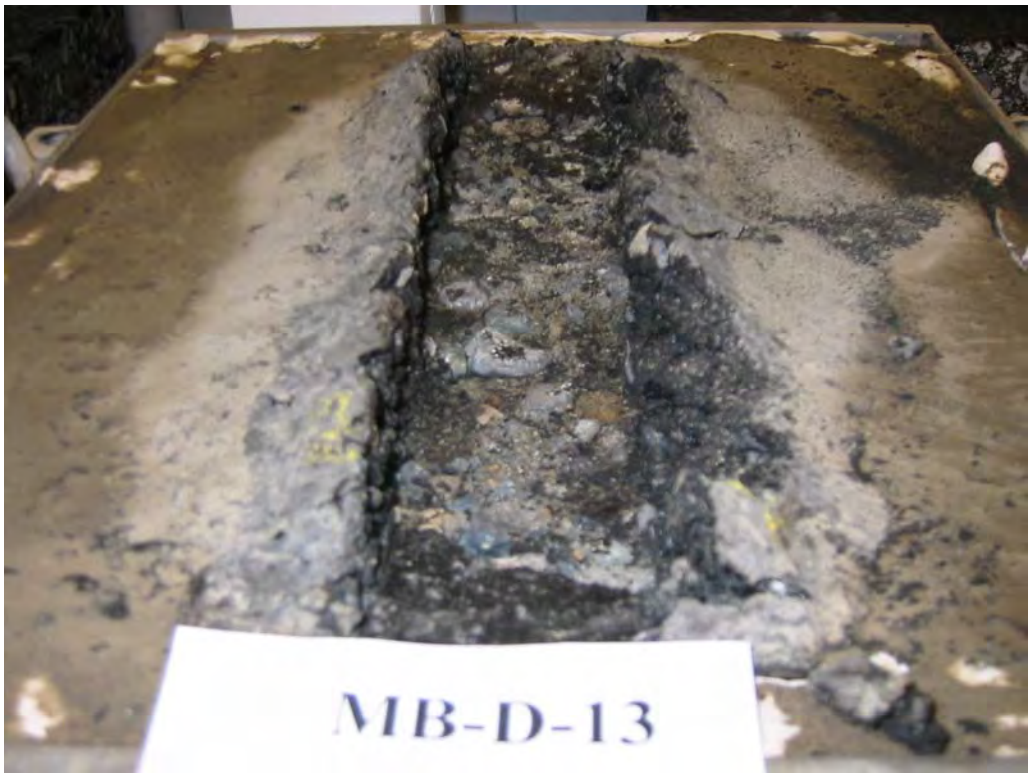


Figure D-20 FMFC MB-D Mix

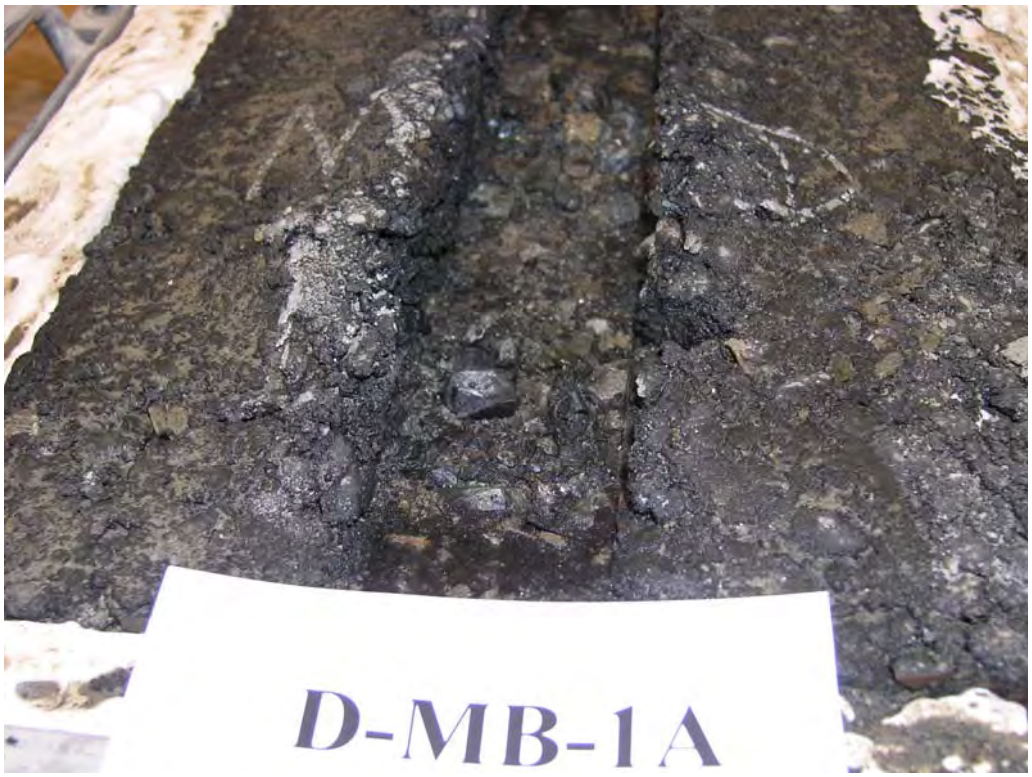


Figure D-21 FMLC MB-D Mix

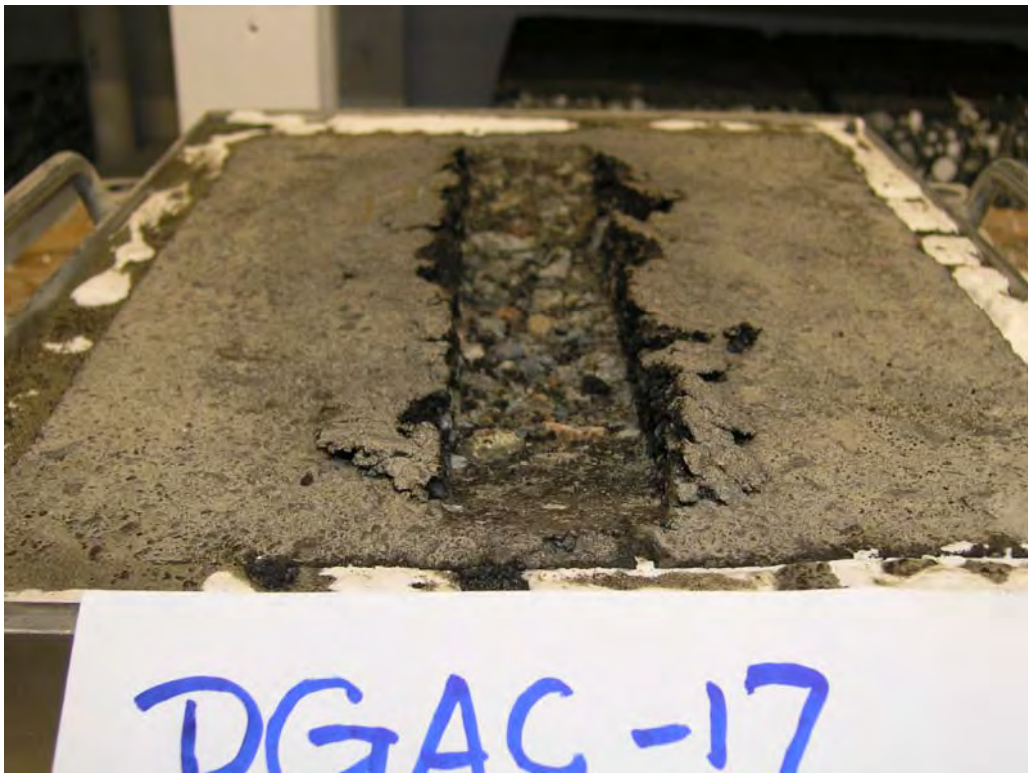


Figure D-22 FMFC DGAC Mix