

FIGURE 13 Comparative laboratory test results.

Performance of the ISAC system is based on the concept of isolating the overlay from movement in the underlying pavement. Figure 14 shows a continuous graphical output for measured deformation at the pavement joint and in an AC overlay during Cycles 28 to 43 in an ISAC test section. The maximum pavement joint expansion is about 1.83 mm as shown in Figure 14. The AC overlay only experiences about 0.6 mm of total deformation in a gauge length of 12.7 cm (strain of about 0.005). The ISAC material performs as a base isolation layer in the pavement overlay system.

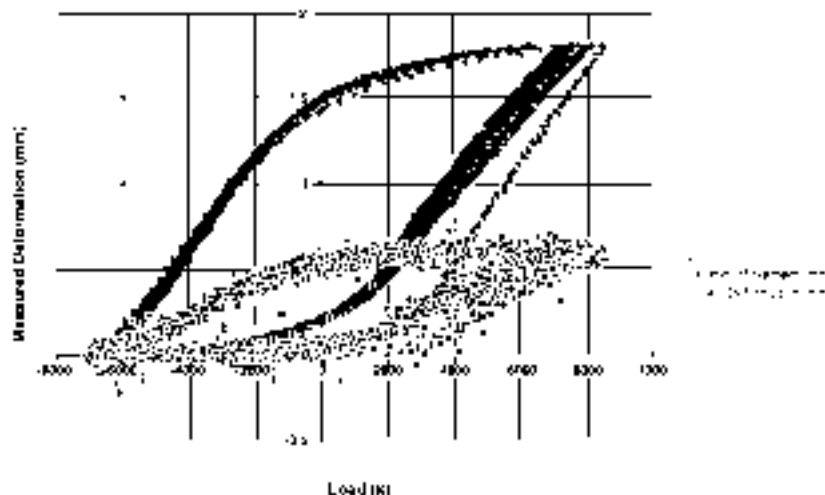


FIGURE 14 Base isolation behavior of ISAC for Cycles 28 to 43.

ISAC FIELD PERFORMANCE

Field performance data from six ISAC field installations are provided in Table 1. Data from both control sections and ISAC sections are shown. The average joint or crack spacing is based on those joints and cracks covered with ISAC.

The first field test site for the ISAC system was a jointed 22.9-cm PCC highway pavement designated as FA Route 567 (IL-38) in Lee and Ogle Counties near Rochelle, Illinois. The pavement construction section, which extended from Station (Sta) 782+70 to Sta 1197+27 [station interval, 100 ft (30.5 m), and total project length, 12.6 km], was completed during the summer of 1994. The construction project consisted of a rubblized section from Sta 782+70 to Sta 908+00, an open-graded base course section from Sta 908+10 to Sta 1022+75, 8.9-cm resurfacing from Sta 1023+15 to Sta 1125+00, and 6.3-cm resurfacing from Sta 1125+20 to Sta 1148+19 and Sta 1151+43 to Sta 1196+82. All sections were overlaid with Illinois bituminous concrete binder (Type 2) and bituminous concrete surface-course material (Class I).

The ISAC system was placed at transverse cracks and joints on the pavement section from Sta 1126+00 to Sta 1130+00. ISAC layers 0.86 m wide were placed across 17 transverse joints and cracks in the pavement. The width of the ISAC materials was determined from laboratory performance observations. On February 8, 1995, a visual inspection of the reflective cracking in test sections on IL-38 was conducted. The air temperature at the time of inspection was about -16°C with clear and windy conditions. On the 8.9-cm AC resurfaced pavement section, 15 full-width reflective cracks were observed in the distance from Sta 1120+00 to Sta 1125+00. On the 6.3-cm AC resurfaced pavement section from Sta 1130+00 to Sta 1135+00, a total of 16 full-width reflective cracks was observed. On the ISAC test section from Sta 1126+00 to Sta 1130+00 with 6.3 cm of AC overlay, no reflective cracks were observed. On November 17, 1995, inspection of IL-38 indicated 16 full-width reflective cracks on the 8.9-cm AC overlay section from Sta 1120+00 to Sta 1125+00 and 18 full-width reflective cracks on the 6.3-cm AC overlay section from Sta 1130+00 to Sta 1135+00. A partial transverse reflective crack about 1.8 m long was observed in the ISAC test section from Sta 1126+00 to Sta