

ABSTRACT

If adequately designed and high quality material and good construction practices are used, portland cement concrete is very durable. This is demonstrated by the oldest pavement in Iowa (second oldest in the U.S.) paved in 1904, which performed well for 70 years without resurfacing. The design thickness is an important factor in both the performance and cost of pavement.

The objective of this paper is to provide a 30-year performance evaluation of a pavement constructed to determine the required design thickness for low volume secondary roadways.

In 1951 Greene County and the Iowa Highway Research Board of the Iowa Department of Transportation initiated a four-mile (6.4 km) demonstration project to evaluate thicknesses ranging from 4-1/2" (11.4 cm) to 6" (15.2 cm).

The project, consisting of 10 research sections, was formed pavement placed on a gravel roadbed with very little preparation except for redistribution of the loose aggregate. Eight sections were non-reinforced except for centerline tie bars and no contraction joints were used. Mesh reinforcing and contraction joints spaced at 29' 7" (9.02 m) intervals were used in two 4-1/2" (11.4 cm) thick sections. The only air entrained section was non-reinforced.

The pavement performed well over its 30-year life carrying a light volume of traffic and did not require major maintenance. There was substantial cracking with average slab length varying directly with thickness. The 4-1/2" (11.4 cm) thick non-air entrained, mesh-reinforced pavement with contraction joints has performed the best.