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# Milled pavement texturing to optimize skid improvements

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### HIGHLIGHTS

• Pavement texturing can improve flexible pavement's skid resistance.

• A forward speed of 70–80 feet per minute is recommended.

• A cutting depth between 0.25 and 0.5 inches are recommended.

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### ABSTRACT

This research evaluated the use of a milling machine to texture pavement surfaces and its effect on skid improvement. Texturing tests with different milling drums, forward speeds and cutting depths were conducted on 31 asphalt pavement sections across Texas. Macrotexture and friction were measured before the milling and 3, 6, 12, and 18 months after the milling. The results show that sections milled with fine drums exhibited a higher skid resistance and macrotexture after milling. The test results also indicate that the forward milling speed is positively associated with both skid resistance and macrotexture. In other words, higher milling speeds tend to produce surfaces with higher skid resistance and macrotexture. The data suggests that milling operations on average provide a service life of about 12 months on seal coats, whereas milling on HMA sections extends the service life beyond 18 months.

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## 1. Introduction

A common method to rehabilitate aging asphalt pavements is to remove the upper portion of the existing surface and place a new layer (mill and overlay). This method helps smooth the pavement surface and improve ride. This is usually done with a milling machine, which uses a cutting drum with teeth to remove the asphalt. Pavement texturing is performed by the same milling machines but only removes as little as 3/8 inch off the surface. Different from a typical mill-and-fill operation, no new wearing course is placed after the milling. Instead, the milled surface will already have the desired texture and skid resistance, and can be opened to traffic directly. This procedure is used in Texas as a stop gap measure due to funding or weather constraints before an overlay can be placed on the surface.

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# 1.1. Influence of pavement texturing

It has been reported that pavement texturing by milling can improve skid resistance. For example, Yaran and Nesichi [1] showed that the skid resistance of a road section in Israel remained high for more than a year and a half after milling. An Iowa texturing research project [2] showed that the friction number of unmilled sections with AC surfacing averaged 38 while the average friction number of the adjacent milled section of the asphalt surface was up to 44. An Oregon DOT conducted a mill-abrading (combination of mill and shotblast) research project [3], indicating that milling increased the skid number of a PCC pavement from 34 to 39. Another study from Virginia [4] also concluded that pavement skid resistance can be effectively increased by texturing the surface.

Studies also showed that pavement texturing can reduce rutting. For example, Marks [2] found that almost all of the rutting was removed by milling with a cutting depth of 0.5 inch. In another research in Wisconsin [5], average road rut values were reduced for 6 years after milling. Rutting was not significant in the first two



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