# Effect of Mat thickness for the Degree of Compaction of Asphalt Pavements

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## Abstract

Compaction of the hot mix asphalt (HMA) is a very important process in road construction. The ability of the load bearing greatly depends on the degree of compaction of the hot mix asphalt pavements (Finn, & Epps, 1980). The degree of compaction depends on various factors. The thickness of the hot mix asphalt mat is a major factor that affects the degree of compaction. Temperature of the hot mix asphalt is very much important for proper compaction. It is mainly governed by the layer thickness. According to the previous research, it is shown that temperature in layers with a low thickness rapidly drop down rather than in the layers with a high thickness.The research aims at finding out, the optimum mat thickness of the asphalt pavements, suitable for Sri Lankan conditions.

In the process compaction of the hot mix asphalt layers, maximum aggregate affects the layer thickness. In general, it is about 2.5 times of the maximum aggregate size. According to the guidelines of the Road Development Authorities (Sri Lanka), most of the asphalt pavements are constructed with layers the thickness of 50mm or lesser (40-50mm).

For the purpose of the investigation, two road projects (Jaffna-Pannai-Kayts road project and AP4-Integrated road package of Anuradhapura) were selected, to find out the optimum mat thickness. Thickness of the asphalt cores and their degree of compactions were obtained from the above projects. The cores within a certain range of breakdown temperatures, were selected to maintain the uniformity. Maximum day time temperature and average monthly velocity details were obtained from the Department of Meteorology. The graph of core thicknesses versus degree of compaction is plotted and optimum compaction range is measured using the graph.

As per the investigation, it shows that, mat thicknesses within the range of 55-60mm have the highest degree of compaction. It is recommended to have a mat thickness about 55-60mm thick, instead of having 50mm or lesser mat thicknesses.

**Keywords**: Mat, thickness, hot mix asphalt, degree of compaction, maximum aggregate size, core sample

## References

F. N. Finn and J. A. Epps (1980), Research report 214-21, Compaction of Hot Mix Asphalt Concrete

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