INTISARI

Kementerian Pekerjaan Umum dan Perumahan Rakyat menjadikan tingkat kemantapan jalan nasional sebagai sasaran strategis guna meningkatkan produktivitas, efisiensi dan pelayanan sistem logistik nasional bagi penguatan daya saing bangsa di lingkup global. Ruas jalan Mantingan–Ngawi merupakan jalan nasionalyang melayani lalulintas dalam jumlah besar maupun beban berlebih dan memiliki fungsi vital bagi ekonomi, baik sisi distribusi barang, hasil bumi dan pergerakan manusia. Kondisi perkerasan banyak mengalami kerusakan yang terjadi secara berulang-ulang..

Pengamatan dan pengujian di lokasi penelitian meliputi pengamatan kondisi perkerasan menggunakan metode Pavement condition index (PCI), survey lalulintas beban berlebih dan pengujian sumur uji. Pengujian di laboratorium meliputi pengujian karakteristik tanah dasar dan derajat pengembangan tanah dasar. Analisis kinerja perkerasan menggunakan metode empiris dan metode analitis berdasarkan data pengujian alat *Falling Weight Deflectometer* (FWD).

Hasil penelitian antar lain tanah dasar pada lokasi penelitian berupa tanah lempung dengan derajat pengembangan >1,5% termasuk klasifikasi pengembangan tinggi. Perkerasan eksisting mempunyai nilai PCI rata-rata 40,68 dengan kategori *poor*. Analisis kinerja perkerasan menggunakan metode empiris menunjukan bahwa perkerasan eksisting tidak mampu melayani lalulintas 10 tahun kedepan. Usaha perbaikan yang dilakukan berupa pemberian lapis tambahan (*overlay*) tebal 34,66 cm. Analisis kinerja perkerasan menggunakan metode analitis diperoleh data regangan pada dasar lapisan beraspal terbesar 76,77 mikrostrain, sekitar 94,7% dari regangan ijin. Regangan pada permukaan tanah dasar terbesar 286,86 mikrostrain, sekitar 184,8% dari regangan ijin. Hal ini menunjukkan bahwa tanah dasar berpengaruh besar dalam penentuan kinerja perkerasan. Perancangan tebal lapis tambahan menggunakan metode empiris tidak mampu menahan lalulintas beban berlebih ditinjau dari kegagalan struktural berupa lendutan permanen.

Kata kunci : *PCI, FWD, lapis tambahan, beban berlebih*

ABSTRACT

Ministry of Public Works and Housing has made the national road servicibility value as a strategic target to increase the productivity, efficiency and service of national logistics system for strengthening the nation's competitiveness in the global scope. Mantingan-Ngawi road segment is a national road which serve large quantities traffic, overloading traffic and has vital functions for the economy, distribution of goods, crops and people's movement. The pavement are continously damaged over a period of time.

The observation and testing at the site are conducted by observation of pavement condition using Pavement Condition Index (PCI) method, overloading traffic survey and test pit investigation. Laboratory tests are done by using characteristics and swelling of subgrade. Pavement performance analysis are conducted using empirical and analytical methods based on the Falling Weight Deflectometer (FWD) data.

The results are the subgrade soil at the research location is clay with swelling degree >1,5% which classified as high swelling degree. The existing pavement has an average PCI values of 40,68 which classified as poor condition. Analysis of pavement performance using empirical method shows that existing pavement is no longer able to serve the traffic for10 years ahead. The measures to improve pavement condition is overlay with the thickness of 34,66 cm. Analysis of pavement performance using analytical method shows that the highest horisontal strain at the bottom of the asphalt layer is 76,77 microstrain, which is about 94,7% of the permissible strain. The highest vertical strain on the top of the subgrade is 286,86 microstrain, which is about 184,8% of the permissible strain. These values indicate that the subgrade has a large influences in the determination of pavement performance. The overlay thickness design using empirical method is unable to withstand the overloading traffic in terms of structural failure in the form of rutting.

Keywords: PCI, FWD, overlay, overloading