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Thesis Title	Permanent Deformation Model for Asphalt Concrete Wearing Course
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Abstract	<p>Rutting is one the major distresses in flexible pavements in Iraq, occurred as a result of increased axle load, and high summer temperature. This type of distress has a major impact on pavement performance, reduces the useful service life of pavement and creates serious hazards for highway users. In order to minimize rutting , it is necessary to pay more attention for material selection and mixture design, as well as to investigate and analyze parameters affecting on rutting resistance.</p> <p>The aim of this work is to investigate the role of asphalt mixture variables, pavement temperature, stress level on pavement rutting and gathering these factors to build a model for rutting prediction. For this purpose, two types of asphalt cement from two sources have been used. A penetration grade of 40-50 from Al-Nasiriyah and 60-70 from Basrah refineries, the aggregate has been brought from Badra quarry, Portland Cement from Tasluja factory and limestone dust from Karbala factory.To accomplish the goal of this work, a wheel tracking test device has been manufactured.To prepare the asphalt concrete slabs, compression strength machine was used to prepare 40 slab specimens of (30 cm length×20 cm width×5 cm height), also 60 Marshall specimen were prepared to find optimum asphalt content and other Marshall properties .Based on Wheel Tracking Test results, models were developed to predict permanent deformation of compacted asphalt concrete mixtures. It has been determined that, the increase in the asphalt content from 4.4 to 5.4% has increased the permanent deformation by 16%, using of asphalt grade 60-70 while asphalt cement 40-50 has increased the permanent deformation by 12%, increase in testing temperature from 40 °C to 60 °C has increased the permanent deformation by 32%,increase of compaction effort from 150 kN to 350 kN has decreased the permanent deformation 29% @ 50 °C, decrease loading time from 1.23 to 0.56 sec has decreased the permanent deformation by 24%, increase the stress applied from 70 to 90 psi has increased the permanent deformation by 34%, increase filler content from 4 to 10% has decreased the permanent deformation by 38%, using portland cement as a filler instead of limestone dust has decreased the permanent deformation 11% @ 7% filler content, using maximum size of aggregate 19 mm instead of 12.5 mm has decreased the permanent deformation 12%.</p> <p>The data of laboratory results were statistically analyzed with the aid of SPSS version 18 software. Permanent deformation model for compacted asphalt concrete wearing course mixtures were developed as a function of: Number of passes, Marshall Stiffness, Temperature, Stress level.</p>

