EFFECT OF LOW-DENSITY POLYETHYLENE (LDPE) PLASTIC WASTE AS AN ASPHALT SUBSTITUTION IN AC-WC MIXTURES ON MARSHALL CHARACTERISTICS

Name	: Sri Imelda
Student ID name	: 4204221490
Supervisors	: Ir. Lizar, S.T., M.T

ABSTRAK

The accumulation of plastic waste in Indonesia has reached a critical level, while the quality of road infrastructure still requires continuous improvement. This study aims to analyze the effect of partial asphalt substitution with (LDPE) Low Density Polyethylene plastic waste from shopping bags (kresek) and plastic glass on the Marshall characteristics of Asphalt Concrete-Wearing Course (AC-WC) mixtures. Material used include 60/70 penetration bitumen, aggregates from Tanjung Balai Karimun and Tanjung Pinang, and shredded LDPE plastic waste. The optimum bitumen Content (OBC) was set at 5.5%. LDPE substitution levels tested were 2.5%, 5%, 7.5%, 10%, 12.5%, and 15% of the optimum asphalt weight using the hot asphlat-cold plastic method. As the LDPE substitution level increased the stability, VIM, VMA, and MQ values tended to increase, while the VFA and density decreased. The flow parameters for all variations still met the required specifications. The result of the study indicate that the optimal substitution rate for plastic shopping bag waste is 5% with a stability of 2102.15 kg, and 2.5% for plastic cup waste with the stability of 1430.47 kg. it can be concluded that LDPE plastic waste mixtures can be used in asphalt mixtures, improving the quality of road pavement and reducing the environmental impact of plastic waste.

***Keyword**: AC-WC, LDPE, Marshall characteristic, Asphalt Substitution, Plastic Waste*