ABSTRAK

STABILITAS DAN KUAT TEKAN PERKERASAN *WEARING COURSE* (WC) MENGGUNAKAN BAHAN PENGIKAT LIMBAH PLASTIK *POLYPROPYLENE* (PP)

Oleh

Rafael Aidil Azra

Peningkatan limbah plastik serta kebutuhan material perkerasan yang memiliki kinerja mekanis yang baik mendorong pemanfaatan *Polypropylene* sebagai bahan alternatif dalam campuran perkerasan. Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan limbah plastik *Polypropylene* sebagai bahan pengikat terhadap stabilitas dan kuat tekan campuran perkerasan *Wearing Course*. Metode yang digunakan adalah eksperimen laboratorium dengan variasi kadar *Polypropylene* terhadap berat bahan pengikat. Pengujian dilakukan melalui uji *Marshall* untuk memperoleh parameter stabilitas, *flow*, *Marshall Quotient*, dan VIM, serta uji kuat tekan menggunakan *Compression Testing Machine*. Hasil penelitian menunjukkan bahwa penambahan limbah plastik *Polypropylene* meningkatkan stabilitas dan kuat tekan campuran. Nilai tersebut cenderung meningkat seiring bertambahnya kadar *Polypropylene*, yang menunjukkan bahwa campuran menjadi lebih padat, kaku, dan memiliki ketahanan yang lebih baik terhadap beban dan deformasi. Namun, kadar yang tinggi menyebabkan campuran menjadi terlalu kaku sehingga mengurangi fleksibilitasnya. Secara umum, penggunaan limbah plastik *Polypropylene* berpotensi meningkatkan kinerja mekanis campuran *Wearing Course* serta mendukung pemanfaatan limbah yang lebih ramah lingkungan.

Kata Kunci: *Polypropylene*, Stabilitas *Marshall*, Kuat Tekan, *Wearing Course*.

ABSTRACT

STABILITY AND COMPRESSIVE STRENGTH OF *WEARING COURSE* (WC) PAVEMENT USING *POLYPROPYLENE* PLASTIC (PP) WASTE AS A *BINDER*

By

Rafael Aidil Azra

The increasing amount of plastic waste and the need for pavement materials with good mechanical performance encourage the use of Polypropylene as an alternative material in asphalt mixtures. This study aims to analyze the effect of using Polypropylene plastic waste as a binder on the stability and compressive strength of Wearing Course pavement mixtures. The method used is a laboratory experimental approach with variations in Polypropylene content based on the weight of the binder. The tests conducted include the Marshall test to obtain stability, flow, Marshall Quotient, and VIM parameters, as well as a compressive strength test using a Compression Testing Machine. The results show that the addition of Polypropylene plastic waste increases the stability and compressive strength of the mixture. These values tend to increase with higher Polypropylene content, indicating that the mixture becomes denser, stiffer, and more resistant to loads and deformation. However, excessive Polypropylene content causes the mixture to become too stiff, reducing its flexibility. In general, the use of Polypropylene plastic waste has good potential to improve the mechanical performance of Wearing Course mixtures while supporting environmentally friendly waste utilization.

Keywords: *Polypropylene, Marshall Stability, Compressive Strength, Wearing Course.*