ABSTRAK

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

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Penelitian ini bertujuan untuk menganalisis pengaruh penggunaan limbah plastik Polypropylene (PP) sebagai bahan pengikat terhadap stabilitas dan kuat tekan campuran perkerasan Binder Course (BC). Penelitian dilatarbelakangi oleh meningkatnya kebutuhan material konstruksi jalan yang kuat dan ramah lingkungan serta tingginya jumlah limbah plastik yang belum dimanfaatkan secara optimal. Penelitian dilakukan di Laboratorium Inti Jalan Raya Fakultas Teknik Universitas Lampung dengan metode eksperimen laboratorium. Variasi kadar plastik PP yang digunakan yaitu 7,5%, 10%, 12,5%, 13,75%, 15%, 15,625%, dan 17,5%. Pengujian dilakukan menggunakan metode Marshall dan Compression Testing Machine (CTM).

Hasil penelitian menunjukkan bahwa peningkatan kadar plastik PP meningkatkan nilai stabilitas, Marshall Quotient (MQ), dan kuat tekan, sedangkan nilai flow cenderung menurun sehingga campuran menjadi lebih kaku. Nilai stabilitas tertinggi diperoleh pada kadar 17,5% sebesar 2315,52 kg dan kuat tekan tertinggi sebesar 20,84 MPa. Namun, kadar tersebut menghasilkan flow di bawah spesifikasi sehingga campuran menjadi terlalu getas. Berdasarkan analisis parameter Marshall dan kuat tekan, kadar optimum diperoleh pada kadar 15,625% karena memberikan keseimbangan terbaik antara stabilitas, fleksibilitas, kekakuan, dan kuat tekan campuran. Penggunaan limbah plastik PP terbukti mampu meningkatkan karakteristik mekanis campuran BC serta berpotensi menjadi alternatif bahan pengikat yang lebih ramah lingkungan dalam konstruksi perkerasan jalan.

Kata kunci: PP, *Binder Course*, Stabilitas, Kuat Tekan, Limbah Plastik

ABSTRACT

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

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This study aims to analyze the effect of using Polypropylene (PP) plastic waste as a binding material on the stability and compressive strength of Binder Course (BC) pavement mixtures. The study was motivated by the increasing demand for strong and environmentally friendly road construction materials, as well as the large amount of plastic waste that has not been optimally utilized. The research was conducted at the Highway Engineering Laboratory, Faculty of Engineering, University of Lampung, using an experimental laboratory method. Variations of PP plastic content used were 7.5%, 10%, 12.5%, 13.75%, 15%, 15.625%, and 17.5%. Testing was carried out using the Marshall method and Compression Testing Machine (CTM).

The results showed that increasing PP plastic content improved the stability, Marshall Quotient (MQ), and compressive strength values, while the flow value tended to decrease, causing the mixture to become stiffer. The highest stability value was obtained at 17.5% PP content with a value of 2315.52 kg, while the highest compressive strength reached 20.84 MPa. However, this percentage produced a flow value below the specification limit, making the mixture too brittle. Based on the analysis of Marshall parameters and compressive strength, the optimum PP content was determined to be 15.625% because it provided the best balance between stability, flexibility, stiffness, and compressive strength of the mixture. The use of PP plastic waste proved to improve the mechanical characteristics of BC mixtures and has the potential to become a more environmentally friendly alternative binding material for road pavement construction.

Keywords: PP, Binder Course, Stability, Compressive Strength, Plastic Waste