ANALISIS KINERJA CAMPURAN BERASPAL DENGAN SUBSTITUSI PLASTIK

Taufik[1], Rini Mulyani[1], Aris Firman Wijaya[2]

ABSTRAK

Indonesia dan China merupakan penyumbang lebih dari sepertiga limbah plastik pada perairan global sehingga dapat merusak ekosistem laut (Jambeck et.al., 2015) dan lingkungan. Untuk itu perlu dilakukan berbagai upaya untuk mengurangi produksi limbah plastik, salah satunya melalui pengolahan kembali *(reuse)* limbah plastik menjadi sesuatu yang berguna. Hal inilah yang melatarbelakangi penelitian ini dimana limbah plastik digunakan sebagai campuran pada aspal plastik dan menguji bagaimana ketahanannya terhadap genangan air hujan. Limbah plastik yang digunakan dalam penelitian ini adalah jenis *low density polyethylene* (LDPE), jenis limbah plastik yang banyak dihasilkan namun kurang dimanfaatkan karena dinilai kurang menarik dan memiliki daya jual yang rendah. Penelitian ini dilakukan untuk mengetahui pengaruh penggunaan LDPE sebagai pengganti agregat campuran AC-WC yang ditinjau dari karakteristik Marshall pada Kadar Aspal Optimum (KAO) yang kemudian dilakukan penggantian sebagian dari total agregat. Variasi kadar LDPE yang digunakan adalah 0%, 2%, 4%, 6% dan 8%. Setiap variasi dibuat sebanyak tiga buah sampel. Dari hasil pengujian didapatkan bahwa dengan penggantian LDPE dalam range 0.1% - 4% cenderung meningkatkan Nilai Stabilitas, VIM, VMA dan Marshall Quotient (MQ), dan nilai Flow dan VFB cenderung menurun.

Kata kunci : Aspal plastik, Kadar Aspal Optimum (KAO), karakteristik Marshall, low density polyethylene.

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ANALYSIS OF MIXED PERFORMANCE BASED ON PLASTIC SUBSTITUTION

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ABSTRACT

Indonesia and China contribute to more than one third of plastic waste in the ocean worldwide, which may damage marine ecosystem (Jambeck et.al., 2015) as well as global environment. Therefore, any efforts to reduce plastic waste need to be done including to recycle or re-use plastic waste and turn it into something useful. The objective of this study is to re-use plastic waste as a mixture in plastic asphalt and to examine its resistance to rain. Plastic waste used in this study was a low-density polyethylene (LDPE) type considering that the LDPE waste is abundant. However, the re-use of LDPE waste was very limited due to its low economic value. This study was conducted to examine the effect of the LDPE waste as an aggregate substitute for AC-WC mixture based on the Marshall Characteristic on the optimum bitumen content, which then partial replacement of some aggregates were made out of the total aggregates. Few variation levels of LDPE of 0%, 2%, 4%, 6% and 8% were used. Three samples were made to represent each variation. Based on the test result, it was found that the LDPE replacement from 0.1% to 4% tend to increase the value of stability, VIM, VMA and Marshall Quotient (MQ), and the Flow and FVB values tend to decrease.

Keyword: Global Ocean, low density polyethylene, Marshall Characteristic, Optimum bitumen content, plastic asphalt.

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