

ABSTRAK

Perkerasan kaku (*rigid pavement*) pada konstruksi *at grade*, tanah sebagai lapisan dasar dari konstruksi perkerasan pada beberapa lokasi memiliki kandungan zat kimia tertentu yang menyebabkan tanah mengandung tingkat kemasaman yang beragam. Tanah dengan $\text{pH} > 7$ termasuk pada lingkungan basa yang mempengaruhi mutu/kekuatan beton dalam menopang beban dinamis atau beban yang bergerak di atasnya. Penelitian ini bertujuan untuk memperoleh campuran dan karakteristik beton baru serta mengetahui optimasi durabilitas perkerasan kaku di lingkungan basa. Metode penelitian ini menggunakan eksperimen di laboratorium dengan benda uji berupa sampel beton ukuran $15 \text{ cm} \times 15 \text{ cm} \times 15 \text{ cm}$ dengan kuat tekan rencana K-400 (33,2 MPa) dengan campuran zat kimia *Plastocrete RT06* dan *Sikament NN* sebagai *admixtures* pada umur 3, 7, 14, 28, 60 dan 90 hari serta dilakukan perawatan (*curing*) menggunakan air normal dan air basa (larutan NaOH) dengan $\text{pH} \pm 8,5$ sebanyak 18 sampel, masing-masing tiga dan menggunakan metode duplo. Sebelum dilakukan pengujian ketahanan jenis (resistivitas) dengan alat *resistivitymeter*, pengujian kepadatan (densitas) dan kuat tekan dinamis menggunakan alat *Ultrasonic Pulse Velocity Test (UPVT)* semua benda uji dibiarkan kering dengan suhu atmosfer selama 1 hari. Hasil *mix design* didapatkan campuran beton baru dengan pengurangan masing-masing kadar air hingga $\pm 25\%$, agregat kasar $\pm 24,07\%$, dan semen $\pm 17,91\%$. Pengujian Durabilitas pada beton yang direndam air basa berupa resistivitas, kepadatan dan kuat tekan beton diperoleh nilai lebih rendah dibandingkan dengan beton perendaman air normal, yakni masing-masing berkurang hingga $\pm 80,96\%$, $\pm 0,72\%$ dan $\pm 0,84\%$ pada usia 90 hari. Nilai korelasi antara kuat tekan diamis dengan nilai UPVT beton air basa sebesar 0,89, dan nilai korelasi antara kuat tekan dinamis dengan kuat tekan statis adalah 0,73.

Kata kunci: beton *admixtures*, lingkungan basa, resistivitas, *Ultrasonic Pulse Velocity Test (UPVT)*.

ABSTRACT

Rigid pavement in at grade construction, the soil as the basic layer of pavement construction in several locations has a certain chemical content that causes the soil to contain varying degrees of acidity. Soil with a pH of > 7 is included in an alkaline environment that affects the quality / strength of concrete in sustaining dynamic loads or loads that move on it. This study aims to obtain mixtures and characteristics of new concrete and to find out the optimization of durability of rigid pavement in an alkaline environment. This research method uses experiments in the laboratory with specimens in the form of concrete samples of 15 cm × 15 cm × 15 cm with compressive strength K-400 (33.2 MPa) with a mixture of Plastocrete RT06 and Sikament NN as admixtures at age 3, 7, 14, 28, 60 and 90 days as well as treatment (curing) using normal water and alkaline water (NaOH solution) with a pH of ± 8.5 as many as 18 samples, each of three and using the duplo method. Before testing the resistivity with a resistivity meter, testing the density and dynamic compressive strength using an Ultrasonic Pulse Velocity Test (UPVT) all specimens were allowed to dry with atmospheric temperature for 1 day. The results of the mix design obtained a new concrete mixture with a reduction in each water content up to ± 25%, crude aggregate ± 24.07%, and cement ± 17.91%. Durability testing of concrete soaked in alkaline water in the form of resistivity, density and compressive strength of concrete obtained lower values compared to normal water immersion concrete, which respectively reduced up to ± 80.96%, ± 0.72% and ± 0.84% at the age of 90 days. Correlation value between the compressive strength of diamis with UPVT value of concrete base water is 0.89, and the correlation value between the compressive strength of dinamyc and static compressive strength is 0.73.

Key words : admixtures concrete, alkali enviroentment, resistivity, Ultrasonic Pulse Velocity Test (UPVT).