ABSTRACT

COMPARISON OF THE EFFECT NAPTHA E121 AND NEXCO POLYNEX HE 500 ADDITION ON THE COMPRESSIVE STRENGTH AND FLEXURAL STRENGTH OF RIGID PAVEMENT CONCRETE

By

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Concrete is a composite material consisting of coarse aggregate, fine aggregate, water and cement as a binder, admixture is often added. The use of concrete is an alternative choice as a substitute for asphalt to be used as rigid pavement construction. Concrete admixture is growing and is widely used in various constructions such as highways.

This study aims to analyze the comparative effect of various concrete mixes with admixture Naptha E121 and Nexco Polynex He 500 on the effect of compressive strength and flexural strength of concrete, as well as find out which admixture is the most effective as an additive to rigid pavement concrete. The ACI 211.1-91 method is used as the basis for planning concrete mixtures. The percentage of admixture used is 0%, 0.6%, 0.75%, 1%, 1.25% and 1.5% by weight of cement. This study used 36 cylindrical specimens measuring 15x30 cm and 36 blocks measuring 15x15x60 cm.

The results of the compressive strength study showed that the compressive strength of concrete mixed with Naptha E121 admixture and Nexco Polynex He 500 was directly proportional to the percentage of admixture addition. The highest compressive strength value of the Naptha E121 admixture at the addition of 1.5% was 39.326 MPa, while that of the Nexco Polynex He 500 1.5% admixture was 38.052 MPa. While the flexural strength test results showed that the highest flexural strength was obtained at a percentage of 0.75% Naptha E121, which was 5.305 MPa, also at a percentage of 0.75% Nexco Polynex He 500, which was 5.165 MPa. From the value of slump, compressive strength, flexural strength, and workability. The most effective percentage of using admixture Naptha E121 and Nexco Polynex He 500 is at a percentage of 0.75%.

Keywords: Concrete, Rigid Pavement, Naptha E121, Nexco Polynex He500, Compressive Strength, Flexural Strength.

ABSTRAK

PERBANDINGAN PENGARUH PENAMBAHAN NAPTHA E121 DAN NEXCO POLYNEX HE 500 TERHADAP KUAT TEKAN DAN KUAT LENTUR BETON *RIGID PAVEMENT*

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Beton merupakan bahan gabungan yang terdiri dari agregat kasar, agregat halus, air dan semen sebagai pengikat, sering kali ditambahkan *admixture*. Penggunaan beton merupakan pilihan alternatif sebagai pengganti aspal untuk dijadikan konstruksi perkerasan kaku *(rigid pavement)*. *Admixture* beton semakin berkembang dan banyak digunakan pada berbagai konstruksi seperti jalan raya.

Penelitian ini bertujuan untuk menganalisis perbandingan pengaruh variasi campuran beton dengan *admixture* Naptha E121 dan Nexco Polynex He 500 terhadap pengaruh kuat tekan dan kuat lentur beton, juga mengetahui campuran *admixture* yang paling efektif sebagai bahan tambahan pada beton *rigid pavement*. Metode ACI 211.1-91 digunakan sebagai dasar perencanaan campuran beton. Persentase *admixture* yang digunakan 0%, 0,6%, 0,75%, 1%, 1,25% dan 1,5% dari berat semen. Penelitian ini menggunakan benda uji berbentuk silinder ukuran 15x30 cm sebanyak 36 buah dan balok ukuran 15x15x60 cm sebanyak 36 buah.

Hasil penelitian kuat tekan menunjukan kuat tekan beton campuran *admixture* Naptha E121 dan Nexco Polynex He 500 berbanding lurus seiring besarnya persentase penambahan *admixture*. Nilai kuat tekan tertinggi *admixture* Naptha E121 pada penambahan 1,5% sebesar 39,326 MPa, sedangkan pada *admixture* Nexco Polynex He 500 1,5% sebesar 38,052 MPa. Sedangkan hasil uji kuat lentur menunjukan, kuat lentur tertinggi diperoleh pada persentase 0,75 % Naptha E121 yaitu sebesar 5,305 MPa, juga pada persentase 0,75% Nexco Polynex He 500 sebesar 5,165 MPa. Dari nilai *slump*, kuat tekan, kuat lentur, serta *workabillity*. Persentase paling efektif penggunaan *admixture* Naptha E121 dan Nexco Polynex He 500 yaitu pada persentase 0,75%.

Kata kunci: Beton, *Rigid Pavement*, Naptha E121, Nexco Polynex He 500, Kuat Tekan Kuat Lentur.