

## INTISARI

Pembebanan dan pertumbuhan lalu lintas yang tinggi menyebabkan bertambahnya beban lalu lintas pada konstruksi jalan yang akan mempercepat terjadinya kerusakan pada lapisan jalan raya. Dilihat dari sumber daya alam pasir kuarsa yang ada, maka perlu adanya penelitian tentang pasir kuarsa. Penelitian ini dilakukan untuk mengetahui seberapa besar pengaruh variasi pasir kuarsa sebagai pengganti agregat halus terhadap campuran AC-WC dengan menggunakan aspal penetrasi 60/70 pertamina sebagai bahan ikat.

Pengujian yang dilakukan dalam penelitian ini adalah uji marshall, *immersion*, dan *indirect tensile strength test* (ITS) untuk mengetahui durabilitas campuran beton aspal dengan KAO setelah dibuat 5 variasi. Variasi kadar pasir kuarsa tersebut dibuat berdasarkan prosentase berat pada setiap nomor saringan pada agregat halus. Durabilitas campuran beton aspal dilihat dari nilai hasil uji marshall, *immersion*, *indirect tensile strength test* (ITS), indeks kekuatan sisa (IKS), indeks kekuatan sisa, dan rasio kuat tarik (TSR).

Hasil pengujian menunjukkan nilai stabilitas marshall secara berturut-turut pada campuran V1, V2, V3, V4, V5 sebesar 1646,5 kg; 1610 kg; 1687 kg; 1761 kg; 1892 kg. sedangkan pada nilai marshall *immersion* secara berturut-turut V1, V2, V3, V4, V5 sebesar 1539 kg; 1495 kg; 1551 kg; 1566 kg; 1609 kg. Campuran mengalami penurunan nilai stabilitas secara berturut-turut pada V1, V2, V3, V4, V5 sebesar 6,5%; 7,1%; 8,0%; 11,1%; 15%. Dari hasil penelitian dapat dilihat penambahan kadar pasir kuarsa menunjukkan peningkatan nilai stabilitas tetapi IKS dalam uji *immersion* penelitian ini hanya V1, V2, dan V3 yang masuk dalam spesifikasi. Pengujian ITS *Un-Condition* menunjukkan nilai tarik berturut-turut V1, V2, V3, V4, V5 sebesar 960 kg/cm<sup>2</sup>; 941 kg/cm<sup>2</sup>; 932 kg/cm<sup>2</sup>; 922 kg/cm<sup>2</sup>; 908 kg/cm<sup>2</sup>. Sedangkan pada ITS *Condition* berturut-turut V1, V2, V3, V4, V5 sebesar 895 kg/cm<sup>2</sup>; 867 kg/cm<sup>2</sup>; 843 kg/cm<sup>2</sup>; 819 kg/cm<sup>2</sup>; 801 kg/cm<sup>2</sup>. Nilai TSR secara berturut-turut V1, V2, V3, V4, V5 sebesar 93,2%; 92,1%; 90,5%; 88,9%; dan 88,2%. Dari nilai stabilitas campuran yang ada dapat dilihat bahwa perendaman secara menerus selama 24 jam tersebut menyebabkan penurunan durabilitas campuran AC-WC, penurunan nilai IKS dan TSR yang semakin besar seiring dengan bertambahnya kadar pasir kuarsa pada tiap variasi.

**Kata kunci :** AC-WC, *indirect tensile strength test* (ITS), Marshall, *immersion*, pasir kuarsa, variasi campuran

## ***ABSTRACT***

*Vehicle loads and high traffic growth nowadays lead to increased traffic loads on road pavement that will accelerate the occurrence of damage to the pavement layer. based from the natural resources of quartz sand, needed to research on quartz sand. In this research was conducted to find out how much influence of quartz sand variation as substitute of fine aggregate to AC-WC mixture by using asphalt pertamina 60/70 to binding the aggregate.*

*Conducted tests in this research were marshall, immersion, and indirect tensile strength (ITS) test to determine the durability of asphalt concrete mixture with optimum bitumen content (OBC) after 5 variations were made. The variations of quartz sand content are made based on the percentage aggregate weight on each filter numbers. The durability of the asphalt concrete mixture was seen from the value of marshall test results, immersion, indirect tensile strength (ITS) test, residual strength index (RSI), and tensile strength ratio (TSR).*

*The results show the value of marshall stability respectively on the mixture of V1, V2, V3, V4, V5 are 1646,5 kg; 1610 kg; 1687 kg; 1761 kg; 1892 kg. Whereas at marshall immersion value respectively on the mixture of V1, V2, V3, V4, V5 are 1539 kg; 1495 kg; 1551 kg; 1566 kg; 1609 kg. The mixture experienced a decrease in stability values respectively on the mixture of V1, V2, V3, V4, V5 sre 6,5%; 7,1%; 8,0%; 11,1%; 15%. Based on the research results, it can be seen the addition of quartz sand content showed an increase in stability value but RSI in immersion test only V1, V2, and V3 are included in the specification that used in this research. The Un-Condition ITS test showed the respectively on the mixture of V1, V2, V3, V4, V5 are 960 kg/cm<sup>2</sup>; 941 kg/cm<sup>2</sup>; 932 kg/cm<sup>2</sup>; 922 kg/cm<sup>2</sup>; and 908 kg/cm<sup>2</sup>. Whereas in ITS Condition respectively on the mixture of V1, V2, V3, V4, V5 are 895 kg/cm<sup>2</sup>; 867 kg/cm<sup>2</sup>; 843 kg/cm<sup>2</sup>; 819 kg/cm<sup>2</sup>; dan 801 kg/cm<sup>2</sup>. The values of TSR respectively on the mixture of V1, V2, V3, V4, V5 are 93,2%; 92,1%; 90,5%; 88,9%; and 88,2%. Based rom the stability value of the existing mixture it can be seen that continuous immersion for 24 hours resulted in decreasing the durability of the AC-WC mixture, the decreasing value of RSI and the increasing TSR as long with the increase of quartz sand content in each variation.*

***Keywords :*** AC-WC, indirect tensile strength test (ITS), Marshall, immersion, quartz sand, variations mixture