

STIFFNESS PROPERTIES OF SEMI-FLEXIBLE PAVEMENT

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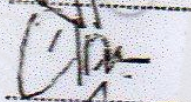
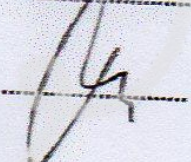
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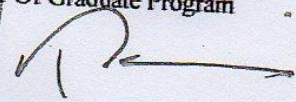
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ABSTRACT

The purpose of this was to make the deserve design of semi flexible pavement and observe the performance of designed semi flexible pavement as the competent design and implementation of semi flexible pavement on heavy traffic road yet are a critical issue.

Grouted macadam, the key content of semi flexible pavement, was made by slight modification of Indonesian standard. Semi flexible pavement was designed successfully at lab and different parametric and important test such as porosity, density, stability, flow ability, Marshal Questioned, Marshal Cone, compressive strength and indirect tensile stiffness modulus were executed effectively. The maximum stability of three types of asphalt was found at different bitumen content. The compressive strength value of best cementitious slurry and grouted macadam was measured at 1, 7 and 28 days.

In the Marsh Cone test, the most effective cementitious slurry utilized only 9.7 seconds releasing from discharge gate of Marsh cone, while the slowest one took 9 minutes 56.4 seconds. The obtained bitumen content at highest stability was 4.3, 4.2 and 3.8 for 60/70, Retona and Polymer asphalt respectively. The Retona asphalt showed the maximum compressive strength value at all various time interval period. The 60/70 asphalt showed the highest indirect tensile stiffness modulus value, 13140 MPa, while polymer demonstrated the lowest value indirect tensile stiffness modulus, 8589 MP, at 30°C. In the end, the proposed design of semi flexible pavement of this research is highly recommended to capitalize for the further improvement of heavy traffic road as it seemed to minimize surface cracks, rutting, and raveling, which cause potholes and particle losses substantially.

Keywords: Semi flexible pavement, Marshal Cone, indirect tensile stiffness modulus, Grouted Macadam, Compressive Strength

ABSTRAK

Tujuan penelitian ini adalah membuat desain semi perkerasan lentur dan mengamati kinerja. Semi perkerasan lentur sebagai desain yang kompeten dalam pelaksanaan semi perkerasan lentur di jalan yang padat lalu lintas, namun merupakan masalah penting.

Makadam grouted, isi kunci semi perkerasan lentur, dibuat oleh sedikit modifikasi dari standar Indonesia. Semi perkerasan lentur dirancang berhasil di laboratorium dan parametrik yang berbeda dan uji penting seperti porositas, densitas, stabilitas, kemampuan mengalir, Marsekal Dipertanyakan, Marsekal Cone, kuat tekan dan langsung tarik modulus kekakuan dieksekusi secara efektif. Stabilitas maksimum tiga jenis aspal ditemukan di kadar aspal yang berbeda. Nilai kuat tekan terbaik bubuk semen dan digROUT makadam diukur pada 1, 7 dan 28 hari.

Pada uji Marsh Cone, bubuk semen yang paling efektif digunakan hanya 9,7 detik melepaskan dari gerbang pembuangan Marsh kerucut, sedangkan yang paling lambat mengambil 9 menit 56,4 detik. Kadar aspal yang diperoleh pada stabilitas tertinggi adalah 4,3, 4,2 dan 3,8 untuk 60/70, Retona dan Polymer aspal masing-masing. The Retona aspal menunjukkan nilai kekuatan maksimum tekan sekali periode jeda berbagai waktu. The 60/70 aspal menunjukkan tarik tak langsung nilai modulus kekakuan tertinggi, 13.140 MPa, sedangkan polimer menunjukkan nilai tarik tak langsung kekakuan modulus termurah, 8589 MP, di 30°C. Pada akhirnya, desain yang diusulkan perkerasan lentur semi penelitian ini sangat dianjurkan untuk memanfaatkan untuk perbaikan lebih lanjut dari jalan lalu lintas yang padat seperti yang terlihat untuk meminimalkan retak permukaan, rutting, dan raveling, yang menyebabkan lubang dan kerugian partikel secara substansial.

Kata kunci: perkerasan Semi fleksibel, Marshal Cone, langsung tarik modulus kekakuan, grouting Macadam, Kuat Tekan

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Appendix A

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LIST OF ABBREVIATIONS

ASTM	= American Society for Testing and Materials
A.D	= Apparent density
A	= Absorption
B_{sg}	= Bulk Specific gravity
B_{sg} (SSD)	= Bulk specific gravity SSD
B₀	= Optimum Bitumen content
B1	= % asphalt content at maximum unit weight
B2	= % asphalt content at maximum stability
B3	= % asphalt content at specified percent air voids in the total mix
b	= Volumetric flash + water + sand
CS	= Compressive Strength
c	= Volumetric flash + water
d	= Oven dry sand
D	= The mean amplitude of the horizontal deformation
FA	= Fly Ash
F	= Flow
ITSM	= Indirect Tensile stiffness modulus
L	= The peak value of the applied vertical load (N) more applications of the load pulse (mm)
MQ	= Marshal Quotient
OBC	= Optimum Bitumen Content
PPC	= Primary Portland Cement
SFP	= Semi flexible Pavement
SMA	= Split Mastic Asphalt
SP	= Super Plasticizer
t	= The mean thickness of the test specimen (mm)
VIM	= Voids in Mix
VFWA	= Voids Filled with Asphalt
v	= Poisson's ratio (a value of .35 is normally used)
W	= Stability