

## **STIFFNESS AND FATIGUE OF AC20 RECYCLED MIXTURES WITH 25% AND 50% RAP**

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### *ABSTRACT*

Nowadays there is an increasing concern for material conservation. In pavement engineering this concern was faced with the use of reclaimed asphalt (RA) or reclaimed asphalt pavement (RAP) in new flexible pavement projects and/or rehabilitation projects. In this study five asphalt concrete (AC) mixtures were produced; a reference AC20-ref mixture with limestone aggregates and a 50/70 penetration grade bitumen, two recycled AC-20 mixtures containing 25% RAP and 50% RAP with 50/70 bitumen, and two recycled AC-20 mixtures containing 25% RAP and 50% RAP with 70/100 bitumen. The aggregate gradation in all mixtures was the same as well as their optimum binder content. The optimum binder content was derived from the mix design procedure of the reference mixture. The performance of all mixtures was determined in terms of their stiffness determined by applying indirect tension on cylindrical specimens (IT-CY) and fatigue resistance performance using indirect tensile test using cylindrical shaped specimens (ITT-CY). Results have shown that stiffness increases with the incorporation of RAP. The highest stiffness value was obtained when 50% RAP and 50/70 bitumen was used. As for the fatigue the performance of the mixtures vary depending on the RAP content and type of bitumen used. The AC mixture with 50% RAP and 70/100 bitumen showed the best fatigue performance of all mixtures tested (reference or recycled mixtures).