UNLOCKING THE FULL POTENTIAL OF RECLAIMED ASPHALT PAVEMENT (RAP) – HIGH QUALITY ASPHALT COURSES INCORPORATING MORE THAN 90% RAP

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Abstract

It is widely accepted that reuse of RAP in the construction of hot mix asphalt is environmentally friendly and also economically beneficial. Addition rates vary from country to country and depending on mix design but very rarely exceed 50 wt % in the final mix.
This paper describes a case study about a mix design incorporating more than 90 % RAP. This mix meets German standards for a wearing course subjected to high traffic loads. An area of 3.850 m^2 aged asphalt concrete wearing course is milled off. Binder content and mineral composition of the RAP coming from a selected road surface is analyzed. The grading curve of the minerals inside the RAP is inspected. Adjustments with virgin aggregate are calculated to generate a final grading curve that meets specification and to accommodate for slightly higher binder content due to rejuvenator addition. Based on the properties of the extracted bitumen proper rejuvenator dosage is calculated as well.
The RAP is heated in a newly designed heating drum and then transferred into a 3 ton batch mixer. In the mixing process the calculated mineral adjustment is added and homogeneously mixed in together with a hydrocarbon reactivator compound. This compound rejuvenates the aged binder and also adjusts modulus to a desired target level. Finally the mix was successfully paved on exactly the site the RAP came from.