

The Effect of Faunus Ater Shell as Filler in Asphalt Concrete Wearing Course (AC-WC) Mixtures

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Abstract. In the composition of the asphalt mixture, the filler is vital to the aggregate skeleton. One of the filler functions is to increase the mixture's stability and density by filling the void in a bigger aggregate. However, since the filler requirement needs to be smaller than 0.075 mm, it isn't easy to collect enough quantity to fulfill the mixture requirement. Hence, this study aims to study the Faunus ater waste as filler in asphalt concrete wearing coarse (AC-WC) mixture, since it is a waste and has little economic value. This study incorporates Bina Marga's specifications and following the standard Marshall testing method to investigate the effect of utilizing Faunus ater (FA) shell as filler. The result shows that the addition of Faunus ater shell in the mixture shows an increase in both stability and flow testing results. Thus, Faunus ater addition as filler may have a good impact on the pavement in terms of stability; however, it needs conservative treatment since the Marshall flow became high. It is not ideal for asphalt pavement.

INTRODUCTION

Roads are a vital infrastructure in the transportation system to connect one place to another to meet economic, social, and cultural needs. Excellent road conditions are needed for smooth transportation activities, namely, to safely and comfortably accelerate the smooth mobilization of goods or services. Based on the Law of the Republic of Indonesia No. 38 of 2004 regarding road infrastructure, states that roads have an essential role in realizing the development of the nation's life [1]. Therefore, this road is very much needed by the community in carrying out daily activities. A road plan is expected to fulfill the road's primary function, namely providing optimal service to the traffic flow through it.

Hot mix asphalt is a type of asphalt mixture with aggregate and filler spread out and compacted in hot conditions [2, 3]. One type of hot mix that is commonly used on road pavement is called Asphalt Concrete (AC). AC consists of a mixture of wear layer AC (Asphalt Concrete - Wearing Course), (AC-WC), a layer between Asphalt Concrete - Binder Course (AC-BC), and a layer of foundation. Asphalt concrete also consists of coarse aggregate, fine aggregate, and asphalt as an adhesive and filler.

AC-WC is a layer of pavement directly related to vehicle tires, a waterproof layer, weather-resistant, and has the required rigidity. The AC-WC mixture consists of aggregate, asphalt as a binder, and filler as a filling agent, which is mixed evenly at a specific temperature. The filler's function in the asphalt concrete mixture is to fill the mixture's cavities to increase the bonding power of the asphalt mixture. It is also expected to increase the stability of the asphalt mixture. Additionally, the filler material can increase the bituminous material's viscosity and reduce its susceptibility to temperature.