Optimizing the use of Cold Milling Material for Asphalt Concrete Road Pavement Recycling

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Abstract

The maintenance of Asphalt Concrete pavement is done when the pavement reach the surface final index, the method of maintenance usually does with overlaying the old pavement with the new one so then the road elevation become increased. The solution of this problem is by removing or milling the old pavement with Cold Milling. The milling or road removal have a big amount of disposal known as Reclaimed Asphalt Pavement (RAP), so it’s necessary to recycle this disposal (RAP) into a new road pavement for the sake of the nature balance.

The main problem is how to recycle the cold milling material into a road pavement recycling and how much its cost.

This research is divided into two steps. The first step is making Do Nothing mixture or hot mixture with 100% of RAP. next step is making modified mixture or hot mixture from RAP with virgin aggregate and virgin bitumen addition, the second step is done when the first mixture is not qualified with Asphalt Concrete specification. After that, the cost of this recycling asphalt concrete can be estimated.
Do Nothing Mixture (mixture with 100% of RAP without modification) is not qualified as asphalt concrete pavement and the modification is needed. The grading of RAP mineral aggregate is not qualified with Bina Marga V specification, the grading damage can be repaired with blending process. The binder quality is still qualified with Asphalt pen 60/70 specification. Modified mixture has a great performance, this mixture has qualified Asphalt Concrete specification. with marshall stability more than 1500, this mixture can be applied for heavily overloaded pavement. The ideal compacting temperature in laboratory is between 138 °C and 160 °C. Recycling process of Cold Milling material can be performed by Drum Mixer machine where the recycling concept is hot process and in-plant recycling. Considering the production cost, Modified mixture is very recommended. Recycling mixture can be a good alternative for conventional Asphalt Concrete with significance saving. The saving of recycling Asphalt Concrete is up to 36,69 % compared with non-recycling Asphalt concrete.

Keywords: Pavement Recycling, Asphalt Concrete, Cost Estimation, Cold Milling of Pavement.