

Evaluation of Malaysian asphaltic concrete mixtures using super pave and Marshall Mix Design Method

Abstract

Rapid development of road infrastructure in Malaysia has led to better researched of asphaltic concrete mixtures. Currently, the conventional Marshall method is widely used to design flexible pavement with bituminous surfacing as wearing course in Malaysia. In 1987 to 1993, strategic highway research program (SHRP) developed a new concept for the design of asphaltic mixtures referred to as Superior Performing Asphalt Pavement (Superpave). This evolvement has certainly improved the asphaltic concrete mixtures especially in terms of the compaction mode. In this study, four different types of mix that meet both Superpave and Malaysian gradation limits were developed and designed using both Superpave and Marshall method. Specimens from both types of mix were also prepared at the optimum asphalt contents. The specimens were also subjected to moisture induced damage test and Indirect Tensile Strength test. Volumetric analyses of the mixes showed that the optimum asphalt content and voids in mineral aggregate (VMA) of the Superpave mixtures is lower than Marshall mixtures. An average of 30 and 20 percent increment in tensile strength is evident for Superpave mixtures conducted for 12.5mm and 9.5mm mixtures compared to Marshall designed mix. However, all mixtures are able to resist deterioration due to moisture.