

ABSTRACT

Pavement surfacing plays a crucial role in the construction and upkeep of roads in Kenya. Asphalt concrete is the predominant material used for these purposes. Despite its common use, traditional asphalt concrete has inherent drawbacks, including diminished durability and susceptibility to both traffic loads and environmental stress. These limitations result in frequent repairs and premature replacements, underscoring the need for the adoption of a more advanced and superior type of asphalt. This study aimed to investigate a gap graded bituminous premix called stone mastic asphalt (SMA), its components and properties that make it the chosen alternative to traditional asphalt concrete for surfacing in the Mtwapa- Kilifi Road project. The methodology adopted for this study included an intensive desk review, highlighting its origin, development over the years in a few international case studies, and site visits to the coastal region of Kenya where it is being applied for the first time in Kenya, with the aim of experiencing the difference in the mix design and method of laying of Stone Mastic Asphalt to conventional Asphalt concrete. Various sources of literature, such as scholarly journals, articles, standard publications and road design manuals were explored for this research. It was found that the choice for Stone Mastic Asphalt was fuelled by the fact that it possesses qualities that best suit the hot environmental conditions of the Kenyan coast, without effects such as bleeding, and with the ability to carry heavier traffic than its alternative would bear without compromising on cost. Notable characteristics highlighted from its past users include; noise reduction, longer lifespan, greater skid resistance and enhanced resistance to permanent deformation. This helped the researcher make the informed approval of its adoption on heavily trafficked road networks and in regions with harsh climates in Kenya, citing increased savings on pavement cost of maintenance. Additionally, urging policy makers to include the design of this gap graded mix in the Road Design Manuals and relevant publications.