

The Cement Stabilized Soil as a Road Base Material for Sri Lankan Roads

W.W.Bandara¹ and W.K.Mampearachchi²

Dense Graded Aggregate Base has been used for road construction work in the Sri Lanka for many years. Rocks which are used to produce the aggregate are not available everywhere in the island. For example it is difficult to find suitable rocks in Northern part of Sri Lanka. Further, the available rocks are gradually decreasing due to the usage, land ownership and ecological issues. Therefore, cement stabilized soil can be used as an economically viable alternative material for the road base.

Soils that can be stabilized are coarse granular, Sandy, Salty and Clayey materials. Coarse granular materials are not widely available in Sri Lanka. Sandy materials are freely available and give higher elastic modulus than Salty and clayed materials. Cement stabilized base need at least 97% compaction of maximum dry density. According to the findings during the construction, it has been revealed that the most practical thickness of the cement stabilized base is 200mm for achieving the compaction. In order to control shrinkage cracks, unconfined compressive strength at seven days is not more than 4 MPa. This can be increased to 6 MPa by providing an Asphalt Crack Relief Layer.

For road pavements with stabilized base, critical tensile stress or strain is located at the bottom of the stabilized layer and the tensile stress should be limited to control the fatigue cracking for required number of axial load repetitions. Above mentioned limitations cannot be analyzed by the conventional Structure Number Based Pavement Design. Hence a Mechanistic – Empirical Method need to be used for the pavement design. This is difficult to carry out in general practice. Therefore, through our project Pavement design charts for the cement stabilized base with Sandy soil were developed by a Mechanistic – Empirical Method.

Key words: *Dense Graded Aggregate Base, Cement Stabilized Soil Base, Asphalt Crack Relief Layer, Structure Number, Mechanistic Empirical Method*

Authors Details;

1. Engineer, 15/5 Pitakanda Rd Kandy. wwbandara@gmail.com, 0775619762
2. Senior Lecturer, Department of Civil Engineering, University of Moratuwa, Katubedda, Sri Lanka. wasanthak@civil.mrt.ac.lk, 0112 650 567 (ext. 2024)