

Optimizing Pavement Construction Procedures in the Southern Desert of Libya

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Abstract : Libya uses a volumetric analysis in designing asphalt mixtures, which can also be upgraded in hot, arid weather. However, in order to be effective, it should include many important aspects which are materials, environment, and method of construction. However, the quality of some roads was below a satisfactory level. This paper examines the factors that contribute to low quality of road performance in Libya. To evaluate these factors, a questionnaire survey and a laboratory comparative study were performed for a few mixes under-represented of temperature and traffic load. In laboratory, rutting test conducted on two different asphalt mixture, these mixes included, an asphalt concrete mix using local aggregate and asphalt binder B(60/70) at the optimum Marshall asphalt content, another mixes designed using Superpave design procedure with the same materials and performance asphalt binder grade PG (70-10). In the survey, the questionnaire was distributed to 55 engineers and specialists in this field. The interview was conducted to a few others, and the factors that were leading to poor performance of asphalt roads were listed as; 1) Owner Experience and technical staff 2) Asphalt characteristics 3) Updating and development of Asphalt Mix Design methods 4) Lack of data collection by authorization Agency 5) Construction and compaction process 6) Mentoring and controlling mixing procedure. Considering and improving these factors will play an important role to improve the pavement performances, longer service life, and lower maintenance costs. This research summarized some recommendations for making asphalt mixtures used in hot, dry areas. Such asphalt mixtures should use asphalt binder which is less affected by pavement temperature change and traffic load. The properties of the mixture, such as durability, deformation, air voids, and performance, largely depend on the type of materials, environment, and mixing method. These properties, in turn, affect the pavement performance.

Keywords : volumetric analysis, pavement performances, hot climate, traffic load, pavement temperature, asphalt mixture, environment, design and construction

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