

Analysis of heavy load pavement for cost Effective Design of Nigerian Port Using British Port Authority Design Charts

Yusuf, I. T.¹ ; Bilewu, S. O.² and Kolo S. S.³

¹ Department of Civil Engineering, University of Ilorin, Ilorin, Nigeria

² Department of water Resource and Environmental Engineering, University of Ilorin, Ilorin, Nigeria

³ Department of Civil Engineering, Federal University of Technology, Minna, Nigeria

E-mail: ityusuf4@gmail.com

Abstract

The intensity of traffic/container loads in operation of ports necessitates the provision of zero/low maintenance heavy load pavements. This paper, therefore, present a construction /maintenance life cycle cost-based pavement that reflects port operational techniques for Nigerian coastal shelf. Data on cargo handling/container traffic statistics in Lagos. The length of the Nigerian west-east territorial coast, types of handling equipment, available material and construction technology prevailing at the ports were also extracted from other relevant sources. The British Ports Federation and the Nigeria Highway Design Manuals were used for the design purposes. Design by Charts were employed with the aid of Microsoft Excel software, while the construction cost analysis was carried out for each pavement type at varying California Bearing Ratio (CBR) values of 1,3,5,10 and 30% for the possible subgrade soil. Result indicated that the rigid and reinforced concrete pavement with low CBR value, are better in technical terms, the reinforced concrete pavement being the best choice economically for all subgrade CBR values and subbase thickness.

Keywords: California Bearing ratio, Cargo handling operation, Design chart, Heavy load pavement, Port