

# **EFFECT OF DISSOLVED WASTE PURE WATER SACHETS ON THE STRENGTH PROPERTIES OF ASPHALT PAVEMENT / MIXES**

**S.S KOLO**

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

**and**

**Y.A. JIMOH**

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

**Abstract:** The dissolved pure water sachet emulsion, achieved at the ratio 1:3 of pure water sachet and DPK at a temperature of about 120° C was added to the optimum bitumen content designed for a HMA mixes. In carrying out this laboratory study, two major steps were used, that is, (i) Conversion of PWS to blendable state with bitumen and (ii) evaluation of bitumen/dissolved pure water sachet blend for asphalt pavement mixes as both partial replacement and additional to the designed optimum binder content. The maximum bitumen content was first determined using the Marshall design method which was found to be 6% for wearing course of a heavily traffic road. This was followed by determination of the dissolved pure water sachet quantity which could be used to replace some quantity of bitumen for the same traffic level (8). Fifteen percent 15% of the dissolved pure water sachet to total mix of bitumen (i.e., 1% PWS and 5% bitumen) had no adverse effect on desired Marshall stability for the heavily traffic road. However further addition of dissolved pure water sachet (PWS) to the optimum binder content to determine how much more of the PWS for the heavily traffic was found to be about 2%, which is about 25% addition to mix. The respective Marshall Stability values of 1,400Kg for unmodified bitumen binder, 1,150kg at 15% partial replacement and 1,200kg at 25% additions to optimum binder content for the dissolved pure water sachet were recorded, while the corresponding flow of 2.6mm for unmodified bitumen binder, 3.2mm for partial replacement and 2.7mm for additions to optimum binder content were obtained, when the samples were subjected to Marshall test.

**Keywords:** Dual purpose kerosene, optimum binder content, dissolved pure water sachet, Marshall Stability design parameters.