Diyala Journal of Engineering Sciences

ISSN 1999-8716
Printed in Iraq

Vol. 09, No. 03, pp. 120-132, September 2016

PROPERTIES OF HIGH STRENGTH LIGHTWEIGHT AGGREGATE CONCRETE PAVING BRICKS

Wasan Ismail Khalil [1] Jabbar Mozan-Suhad Abd Al[2]

1, Professor,Building and Construction Engineering Department, University of Technology/Baghdad., E-mail: wasan1959@yahoo.com,

2, suhad_mozan@yahoo.com ,

(Received: 29/6/2015; Accepted: 11/1/2016)

ABSTRACT: - This investigation aims to study the properties of paving brick products made from high strength lightweight aggregate concrete (HSLWAC). The mix proportion is 1: 1.35: 0.87 (cement: sand: coarse aggregate) by weight with 520 kg/m3 cement. Local porcelinate coarse aggregate, with maximum size of 9.5 mm, 5% silica fume as partial replacement by weight of cement, 1% by weight of cement superplasticizer, and w/c ratio of 0.29, was used in the mix. Fibers are used including macro hooked steel fiber with aspect ratio 100, micro polypropylene fiber (pp), and micro carbon fiber (CF). Concrete paving brick was produced from three different HSLWAC mixes including, concrete mix without fibers (reference mix), hybrid fibers reinforced concrete mix containing 0.75% volume fraction of steel fiber and 0.25% volume fraction of polypropylene fiber, and hybrid fibers reinforced HSLWAC mix with 0.75% volume fraction of steel fiber and 0.25% volume fraction of carbon fiber. Experimental tests including, compressive strength, absorption, abrasion resistance as well as the appearance were carried out for the produced paving bricks.

The results indicated that the produced HSLWAC paving bricks can be classified as medium loading type according to Iraqi Specification No. 1606-2009. This type is used for paving low loaded roads and service areas.

Keywords: Lightweight Concrete, Hybrid, Fibers, Macro, Micro, Steel Fiber, Carbon Fiber, Polypropylene Fiber, Paving Bricks.