



Experimental Investigation of Compressive Strength and Infiltration Rate of Pervious Concrete by Fully Reduction of Sand

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Abstract

The aim of the study is to investigate compressive strength of pervious concrete by reduction of fine aggregate from zero to 100%, additionally investigate infiltration rate of pervious concrete. Experimental study has conducted at Cecos Engineering University Peshawar. The pervious concrete samples were produced for 7 and 28 days. Compressive strength of pervious concrete indicated higher reduction of the sand reduces compressive strength and almost 50% compressive strength decreased by reduction of 100% sand from the design mix. On the other side, infiltration rate for 28 days shows direct relation above 40% reduction of sand and highest 273% of infiltration rate by reducing 100% sand from the design mix. The 90% reduction of sand from concrete give considerable compressive strength of 2150 psi and infiltration rate of 165.79 inch/hour, which can be recommended for pavements of parking and walking area.

Keywords: Pervious Concrete; Fine Aggregate Reduction; Compressive Strength; Infiltration Rate.

1. Introduction

The socio-economic climate around the world has changed drastically in the past few decades. The drastic effect of the socio economic has witnessed more visibly in the world has reshaped in the form of high rise buildings infrastructure, transportation infrastructure, dams, tunnels etc. These infrastructures has massively consumed and still highly depends on the natural resources among gravel, stones and sand are the most common material [1]. In the era sustainable development is needed for the environmental protection, energy saving and effective construction waste management. The concept of sustainable development has wide application so within the concept some researchers have reviewed impervious surface and waste of rainwater. A larger amount of rainwater ends up falling on impervious surfaces such as parking lots, driveways, sidewalks, and streets rather than soaking into the soil. This creates an imbalance in the natural ecosystem and leads to a host of problems including erosion, floods, ground water level depletion and pollution of rivers, lakes, and coastal waters as rainwater rushing across pavement surfaces picks up everything from oil and grease spills to de-icing Salts and chemical fertilizers [2-4]. Typically, parking lots, driveways, sidewalks and streets etc is constructed with Portland cement concrete. The impermeable nature of conventional cement concrete is help to increase the water runoff on the surface over-burdening the infrastructure and causing excessive flooding in built-up areas. Pervious concrete has less resistant and allow water to infiltrate into the ground surface also contribute to the rainwater harvesting. Recently, in the sustainable development and construction pervious concrete plays vital role due

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