

EXPERIMENTAL INVESTIGATION ON PERVIOUS CONCRETE USING NANO SILICA

S.N.Kannan¹, B.Mohan Raj², G.Sugila Devi³

¹PG Student, Nadar Saraaswathi College of Engineering and Technology, Theni, Tamilnadu, India

² PG Student, Nadar Saraaswathi College of Engineering and Technology, Theni, Tamilnadu, India

³Assistant Professor, Nadar Saraaswathi College of Engineering and Technology, Theni, Tamilnadu, India

Abstract - As a civil engineer and human being it's our prime duty to save environment, because lack of water absorption and air permeability of common concrete pavement, rain water is not entered in to the ground directly. It reduces ground water table, and difficult to maintain temperature and humidity of the earth. To minimize such affects, the new concept of pervious concrete pavement is done. Pervious concrete as a paving material has seen renewed interest due to its ability to allow water to flow through itself to recharge groundwater level and minimize storm water runoff. Pervious concrete pavement is unique and effective means to meet growing environmental demands. By capturing rainwater and allowing it to seep into the ground. This pavement technology creates more efficient land use by eliminating the need for retention ponds, swell, and other costly storm water management devices. In this the determination of compressive strength between pervious concrete with silica and conventional concrete. The compressive strength is relatively low on pervious concrete compare to conventional concrete because of its porosity but at the same time we increase water absorption quality. Due to low strength we cannot be used as a road pavement. The pervious concrete can only be applied to footpaths, light traffic areas, and parking where low strength is required.

Key Words: Pervious concrete, Storm water, Porosity, Ground Water recharge, Nano Silica.

1. INTRODUCTION

Pervious concrete (also called porous concrete, permeable concrete, no fines concrete and porous pavement) it is a special type of concrete with a high porosity used for concrete flat applications allows water from precipitation and other sources to pass directly to reach the ground, thereby reducing the runoff from a site and allowing groundwater recharge. Pervious concrete is made using large aggregates with no fine aggregates. The concrete paste then coats the aggregates and allows water to pass through the concrete slab. Pervious concrete is mainly used in parking areas, areas with light traffic, residential streets, pedestrian walkways, and green houses. It is an important application for sustainable construction and is one of many low impact development techniques used by builders to protect water quality. The basic ingredients of pervious

cement concrete mix are not very different from the conventional cement concrete mix, except in the proportion of ingredients. The main ingredients are cementations material, water, aggregate and admixtures.

2. EXPERIMENTAL INVESTIGATION

2.1 Material Used

2.1.1 Cement

Ordinary Portland cement, 53Grade conforming to IS: 269 – 1976. Ordinary Portland cement, 53 Grade was used for casting all the Specimens. Different types of cement have different water requirements to produce pastes of standard consistence. Different types of cement also will produce concrete have a different rates of strength development. The choice of brand and type of cement is the most important to produce a good quality of concrete. The type of cement affects the rate of hydration, so that the strengths at early ages can be considerably influenced by the particular cement used. It is also important to ensure compatibility of the chemical and mineral admixtures with cement.

2.1.2 Coarse Aggregate

Grading of combined coarse aggregate having the sizes of 5-10mm was used. The properties of coarse aggregate are tabulated below.

Table -1: Properties of Coarse Aggregate

S.No	CHARACTERISTICS	VALUES
1	Type	Crushed
2	Specific gravity	2.89
3	Fineness modulus	6
4	Water absorption	0.83%
5	Particle Shape	Angle
6	Impact Value	9%
7	Crushing Value	19