IOSR Journal of Engineering (IOSRJEN) www.iosrjen.org
ISSN (e): 2250-3021, ISSN (p): 2278-8719
Special Issue || Dec. 2019 || PP 53-54
International Conference on Management Practices, Innovations & Research 2019

To Study the Compressive Strength of Pervious Concrete: A Review

Hrushikesh Landage[1], Devanshu Ramekar[2], Sabuj Mandal[3], Gaurav Yerekar[4], Durgadas Rude[5], Arati Rathod[6], Sandeep Gaikwad[7]

[1, 2, 3,4,5,6]*Students: Department of Civil Engineering*
[7]*Assistant Professor: Department of Civil Engineering*
Tulsiramji Gaikwad Patil College of Engineering and Technology, Mohgaon, Nagpur, Maharashtra (India)

Abstract*: Pervious Concrete is a type of Concrete which is highly porous and used for reducing the groundwater flow. Pervious Concrete is made completely made with Coarse Aggregate, Fine Aggregate is Completely Eliminated in this type of Concrete .the concrete allows water from precipitation and other sources to directly pass through it. Pervious concrete helps in recharging groundwater and this technology is best for rainwater Harvesting. the cement binds the coarse aggregate particles and allows water to percolate through it .pervious concrete was originally introduced in 1800 in Europe and was used as pavement surfacing and load-bearing walls, pervious concrete became popular in India in 2000. If the addition of fine aggregate in this type of concrete then the compressive strength is increased and the porosity decrease this type of concrete is used in footpath, gardens .the objective of the paper is to discuss the compressive strength of concrete.*

Keywords: *Pervious, Concrete, Technology, Compressive Strength, Porosity, Recharging, Rain water Harvesting*

I. Introduction

Pervious concrete is a special type of concrete with a highly porous and used for concrete flatwork applications. It allows water from precipitation and other sources to pass it allows water from precipitation and other sources to pass directly through, thereby reducing the runoff from a site and directly through, thereby reducing the runoff from a site and allowing groundwater recharge. Allowing groundwater to recharge. It is well known as gap graded concrete or permeable concrete. Pervious concrete has little or no fine aggregate. It has just enough cementitious paste to coat the coarse aggregate particles while preserving the interconnectivity of aggregate particles. Application of Pervious concrete is in traditional parking areas with light traffic, pedestrian walkways, and greenhouses and with light traffic and helps in sustainable construction voids are 15 to 35% allowing for the quick drain of water. The infiltration rate of pervious concrete is in a range of 80 to 720 liters per minute per square meter.

II. Literature Review

1. Nikhil Saboo et al. [1] in his paper effect of fly ash and metakaolin on pervious concrete properties came up with the following observation. Metakaolin decrease porosity significantly, Curing condition has no significant effect on Pervious Concrete Properties. Fly ash content more influence on permeability than the porosity

2.Hilal Ei Hasan et al.[2] in his paper study of pervious concrete incorporating recycled concrete aggregate and slag is found RCA replacement reduced physical-mechanical durability performance and Slag corporation enhanced pervious concrete properties

3.Bouma Debnath et al.[3] in his paper Permeability prediction and pore structures feature of pervious concrete brick as aggregate found that Not only the porosity of the mix but also the other parameter like water to cement ratio of the mix is important as it controls the workability of concrete. The limiting range for the water-cement ratio is selected and is kept between 0.30 and 0.32. The size of the aggregate gradation has the maximum. Effect on the porosity and permeability of the mix. An increase in aggregate size leads to an increase in permeability

4. Ankush K et al. [4] in his paper has discussed various properties of pervious concrete such as mechanical, hydrological, durability, field performance, and Environmental and cost-benefits aspects. Based on the previous studies, overall, the past studies indicated that the pervious concrete mix is a very promising candidate to be used as a pavement material in low-volume roads such as local streets, pedestrian walkways and highways in future.

5.Hariyadia et al.[5] in his paper Enhancing the performance of porous concrete by utilizing the pumice aggregate say that the effects of utilizing volcanic pumice as aggregate replacement materials for enhancing the mechanical properties (e.g. compressive strength and flexural strength) and quality control properties (e.g

density and void content) of porous concrete is evaluated. It is found that utilizing volcanic pumice on porous Concrete mixtures resulting in a high porosity (void content) and a low modulus of elasticity of porous concrete.
6.Boshsan Huang et al.[6] In this paper Use of the combination of latex, natural sand, and fiber could Produce acceptable pervious concrete with both enough drainage And strength properties. Latex and sand could both decrease the porosity and permeability of pervious concrete and increase the compressive strength of pervious concrete. However, only the addition of latex could Increase the split tensile strength of pervious concrete. Fiber did not have a significant effect on the strength properties
7. Ahmad Ibrahim et al. [7] in his paper Experimental study on Portland cement pervious concrete mechanical and hydrological properties. The average density of pervious concrete was around 1716 kg/m3, with a porosity of 37%. The compressive strength of pervious concrete is low compared to conventional concrete due to its high porosity. Using cement content of 150 kg/m3 with a single size aggregate Of 9.5 mm decreased the compressive strength by 75% compared to the highest value obtained. The average water permeability coefficient of produced concrete from poor graded coarse aggregate is approximately 0.021 m/s. As expected, if the density of previous concretes increases, the porosity and water permeability decrease.

III. Conclusion

From the above literature review, we come to know that, When the permeability of pervious concrete increases the compressive strength decreases. There is a need to maintain a proper void ratio if void ratio increases the permeability increase and strength decrease. The material selection has a great impact on the strength of pervious concrete. The fine aggregate increase the strength but decrease the permeability. There is a need to work on compressive strength of Pervious concrete so it can be used in more application

Reference

[1]. Effect of Fly-ash and Metakolin on Pervious Concrete Properties Volume: 223(2019)322-328
[2]. Properties of pervious Concrete incorporating recycled Concrete aggregate and slag Volume: 212(2019)164-175
[3]. Permeability prediction and pore structure feature of pervious concrete using brick as aggregate Volume: 213 (2019) 643–651
[4]. Pervious concrete as a sustainable pavement material – Research findings and future prospects: A state-of-the-art review Volume: 111 (2016) 262–274
[5]. Enhancing the performance of porous concrete by utilizing the pumice aggregate Volume: 125 (2015) 732 – 738
[6]. Laboratory evaluation of permeability and strength of polymer-modified pervious concrete Volume: 24 (2010) 818–823
[7]. Experimental study on Portland cement pervious concrete mechanical and hydrological properties Volume: 50 (2014) 524–529