

Strength Studies on Pervious Concrete

¹CH.Vijay, ²J.Sree Naga Chaitanya, ³Dr.K.Chandramouli, ⁴Dr.N.Pannirselvam,⁵G.Sai Srinivasulu

^{1&2}Assistant Professor, Department of Civil Engineering, NRI Institute of Technology, Visadala (V), Medikonduru (M), Guntur, Andhra Pradesh, INDIA

³Professor & HOD, Department of Civil Engineering, NRI Institute of Technology, Visadala (V), Medikonduru (M), Guntur, Andhra Pradesh, INDIA

⁴Associate Professor, Department of Civil Engineering, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamilnadu, INDIA

⁵B. Tech Student Department of Civil Engineering, NRI Institute of Technology, Perecherla, Guntur, India

Abstract: Pervious concrete is a very special type of concrete with high porosity used for flat work application basically that allows water from precipitation and other sources to pass directly through thereby reducing the runoff from the site and allowing ground water recharge. And in this concrete porosity is attained by a highly interconnected void content. Also, in permeable or pervious concrete has no fine aggregate and has just enough cementing paste to coarse aggregate particles while preserving the interconnectivity of the voids. Permeable or pervious concrete is traditionally used in parking area with low traffic, walkways in park and garden residential, green house, basketball court, volleyball house.

Index Terms – Compressive Strength, Pervious Concrete, Mix Proportioning.

I. INTRODUCTION

Portland cement pervious concrete (PCPC) is very popular and continuously gaining a lot of attention in construction industry. Pervious concrete is typically designed with high void content (15-25%). There are no fine aggregates in pervious concrete.

In pervious concrete the most important and basic principle which turns out to be different from other types of concrete like PCC and RCC because, it has no fine aggregates in it? Pervious concrete also has interconnected voids and because of that water will percolate and spread in all directions which is not possible if those joints are not interconnected.

II. MATERIAL PROPERTIES

2.1 Aggregates: In pervious concrete generally singular size of coarse aggregates are used. For design of pervious concrete we used 16 mm of coarse aggregates as per the IS code 10262:2009 for mix design and also if coarse aggregate size decreases compressive strength increases.

2.2 Cementitious Material: Cement is mainly used as a binder material in concrete which is used for construction that sets, hardens to other materials bind together. OPC (ordinary Portland cement) of 53 grade is used in construction purpose 1.

III. MIX DESIGN

The mix design for water: cement: fine aggregates: coarse aggregates = 0.36:1:0:4 (as per the IS code 10262:2009)

IV. EXPERIMENTAL RESULTS

4.1 Compressive strength: The compressive strength of pervious concrete (Fig.1).

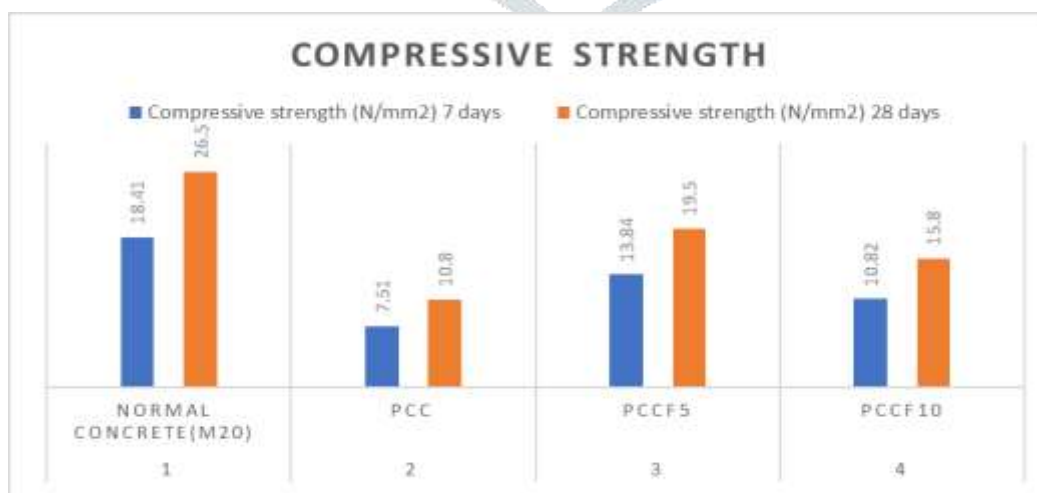


Figure 1: Compressive strength of pervious concrete

b. Split tensile strength test: The experiment is performed by putting a cylindrical sample horizontally between a compression testing machine's loading surface and the load is applied until the cylinder fails along the vertical diameter (Fig.2).

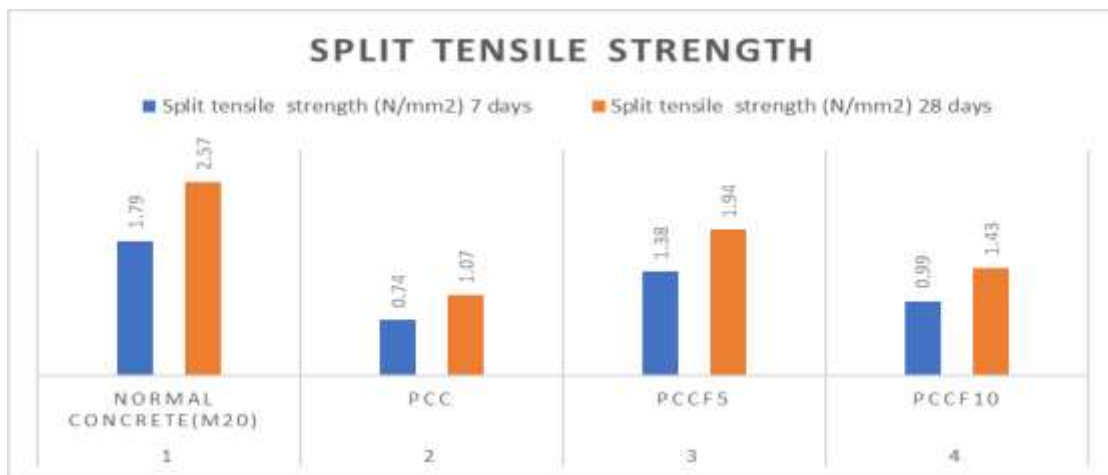


Figure 2: Split tensile strength of pervious concrete

V. CONCLUSIONS

1. Compressive strength of pervious concrete depends upon the porosity of concrete, age, binder material (type of cement), test specimen shape and size, showed huge influence on the strength of pervious concrete.
2. Compressive strength is inversely proportional to porosity hence, when compressive strength increases porosity decreases.
3. Reduction in the aggregate size decreases the porosity because of its inter relation with no fine aggregate property.
4. Porous concrete is unsuitable for heavy duty roads.

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AUTHOR'S PROFILE

CH. VIJAY working as Assistant Professor at NRI Institute of Technology, Andhra Pradesh, India. He completed M. Tech in structural engineering.



J. SREE NAGA CHAITANYA Assistant Professor at NRI Institute of Technology, Andhra Pradesh, India, she completed M. Tech in structural engineering from JNTUH. Her research interests include concrete Technology and structural engineering. She is the author of over 10 papers in refereed journals and International Conference including 1 paper. She is a member of M.I.S.T.E, IAENG.



Dr. K. CHANDRAMOULI Working as Professor & HOD Civil Engineering at NRI Institute of Technology, Andhra Pradesh, INDIA. He completed Ph.D. from JNTU Hyderabad. His research interests include Concrete Technology and Structural Engineering. He published over 115 papers in various international journals and International Conferences, which includes 14 SCOPUS INDEXED research papers. He received 5 International awards for his research in concrete technology. He is a member of WORLD RESEARCH COUNCIL, M.I.S.T.E., M.I.C.I., IAENG.



DR. N. PANNIRSELVAM working as Associate Professor in SRMIST, Kattankulathur, Tamilnadu, He completed Ph.D. from Annamalai University, Tamilnadu as full-time research scholar and has 15 years of teaching experience and 4 years in VIT University, Vellore. At presently guiding 7 PhD Scholars. His research interests include concrete composites, concrete materials and structural engineering. He published over 60 papers in various international journals. He has been serving as reviewer and editorial board member in reputed international journals



G.SAI SRINIVASULU pursuing B. TECH in the department of civil in NRI institute of technology

