

Study And Implementation of Pervious Concrete Pavement For Parking Purpose In Bansal College

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Abstract- The pervious concrete is a special type of concrete also called Zero slump concrete consisting gap graded system. It is very useful in green building. Generally, consists of cement, coarse aggregates and sand in very less or no amount.

In this paper study and design of pervious concrete pavement in parking of college campus is discussed and the properties like compressive strength, permeability etc are determined as well as the advantages and disadvantages are discussed.

Keywords- Pervious concrete, zero slump, Gap Graded system, Permeability.

I. INTRODUCTION

Pervious concrete (also termed as Porous concrete or No fine concrete) is a special type of concrete with a high porosity used for concrete flatwork applications that allows water from precipitation and other sources to pass directly through this reduces the runoff from ground and allows ground water recharge.

Pervious concrete is a Zero slump open grained material consisting of hydraulic cement, coarse aggregates, admixtures and water. In the absence of fine aggregates, pervious concrete has pores size ranges from 2 mm to 8 mm, and the void content usually ranges from 15 % to 25% with compressive strength of 2.8 Mpa to 28 Mpa (generally 2.8 Mpa to 10mpa is mostly observed). The draining rate of pervious concrete pavement will vary with aggregate size and density of mixture, it generally falls within the range of 814 to 730 L/Min. / m².

II. HISTORY OF PERVIOUS CONCRETE

Pervious concrete was firstly used in the 1800s in Europe as pavement surfacing. It became Popular again in 1920 for two storey homes in Scotland and England. In India it became popular in 2000.

Advantages of pervious concrete

1. It has the ability of covering large water volumes
2. Pervious concrete provides good texture.
3. Very less amount or no sand is used in the preparation of pervious concrete.
4. It recharges the water table and solves the problem of water shortage.

Disadvantages of pervious concrete

1. It has low flexural strength than conventional concrete.
2. Proper maintenance is required to avoid chocking of pores.
3. Salinity should be avoided otherwise it will cause chocking.
4. It has low resistance to thermal action.

Implementation of pervious concrete pavement in BANSAL College campus

We had planned to cover parking area with pervious concrete having size: 15m x 10m x 0.1m

We provided aggregates of average size 12.5 mm and ordinary Portland cement of C 43 grade.

Following quantities of materials were provided

Corse aggregate: - 8500 kg

OPC cement: - 200 kg

Water (Tap Water): - 420 kg

A/C ratio: - 7.07

W/ C ratio: - 0.35

As per this configuration following parameters were decided

There are many Environmental benefits of pervious concrete such as retain storm water, recharge ground water, keep pavement surfaces dry even in wet situation, reduce or no storm water drainage is required, allow water and air to get to the roots of trees in the area, remove oil and other pollutions from the that washes off the surfaces, reduce heat island effect, allow to claim LEED points or SLGBC points to green certificates in US or in INDIA.

For flexural strength

The flexural strength of pervious concrete sample is generally coming as 15 % to 20 % of the compressive strength of sample. This flexural strength of pervious concrete can be increased by providing some admixture.

III. REVIEW OF TEST RESULTS

For the cube size 150mm x 150mm x 150 mm standard following test results were obtained for different configurations: -

A/C ratio	W/ C ratio	Age of testing in Days	Compressive strength in MPA
6	0.35	3	8.92
6	0.35	7	11.02
6	0.35	28	14.33
8	0.40	3	5.78
8	0.40	7	6.89
8	0.40	28	9.30
10	0.45	3	4.30
10	0.45	7	5.73
10	0.45	28	6.95

The test results can be also analyzed with the help of graphs in the graph the compressive strength vs. time of testing is shown that is an important tool for analyzing the strength properties.

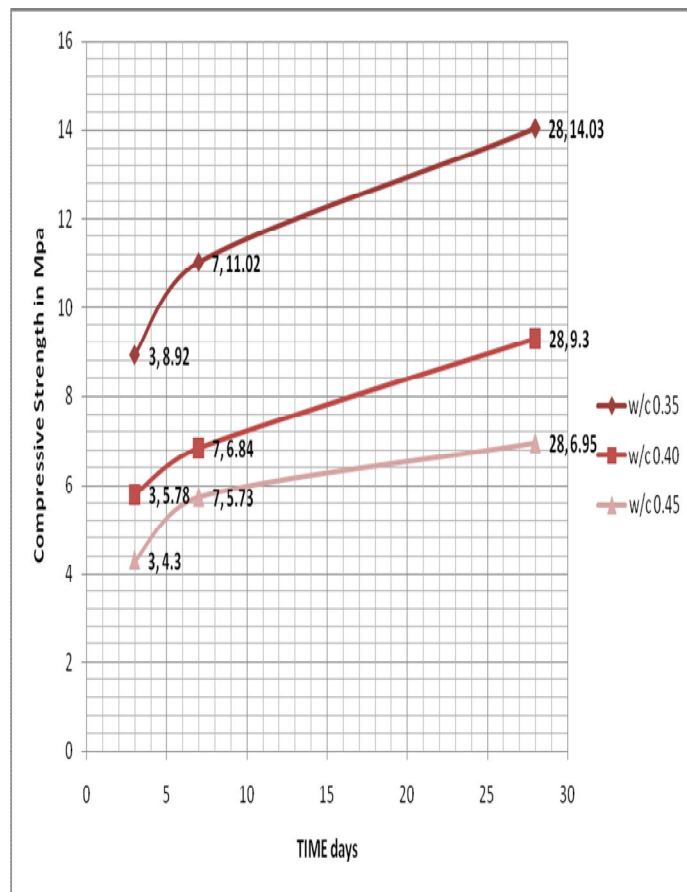


Fig. - Compressive strength v/s Age of Sample

IV. CONCLUSION

Hence it can be concluded that pervious concrete pavement can be used for ground water recharge where ground water level is low and can be used for low traffic. It is thus implemented in Bansal college campus and shows good result. Fresh pervious concrete is known to be stiff and also has the lower workability than conventional concrete.

The compressive strength of pervious concrete is between 2.8 Mpa to 20 Mpa but most commonly it is seen as 2.8 Mpa to 10mpa in normal conditions.

The flexural strength of pervious concrete is 15 % to 20% of the compressive strength i.e. 3.8 Mpa to 10 Mpa.

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