

“MAKING POROUS CONCRETE FOR RAIN WATER HARVESTING AND URBAN ROAD”

Prof. B.A.Hase^{*1}, Vaibhav Bhandwalkar^{*2}, Tejas Dere^{*3}, Vaibhav Patekar^{*4}, Sangram Magar^{*5}

^{*1}Lecturer, Department of Civil Engineering, JSPM's Bhivrabai Sawant Polytechnic, Pune, India.

^{*2,3,4,5}Students, Department of Civil Engineering, JSPM's Bhivrabai Sawant Polytechnic, Pune, India.

ABSTRACT

Pervious concrete has a interconnected pore structure that allows water flow through its entire structure. This concrete is being used as paving material in the india for construction of side walk and secondary roads. The use of pervious concrete was found to reduce the ground water runoff and seepage in soil for increasing ground water table. The production of good quality pervious concrete is necessary for good seepage of storm water. It is made with coarse aggregate, cement and water. also sometimes we added sand in it, and for better bonding add the admixtures.

The properties of concrete studied is porosity compressive strength, weight loss in drying and water permeability test. Pervious concrete has no fine aggregate or very little amount of sand using in it.

Pervious concrete is also known as porous concrete. It is sustainable construction and no any affect on environment. Many builders can use this pavement blocks for increasing ground water table.

KEYWORDS: Concrete, Testing Machine, etc.

I. INTRODUCTION

the pervious concrete is used in construction of secondary roads.. it will also known as permeable concrete, no fine concrete and gap graded concrete. Pervious concrete is a no slump. It contains water cement course aggregate and some admixtures. It contains very low medium sand. Sometimes it referred as no fines concrete. In modern area developers and other private companies are also using it to free up valuable real estate for development.

Porous pavement are able to increase water ability and soil PH. Porous concrete blocks applicable for low volume pavement, residential roads, parking lots and urban roads. Concrete is light in weight (about 1600 to 2000 kg/m³). Pervious concretes functions is absorb the water and pass it into surrounding soil. it also use as a filtration unit of rainwater in urban area. it also useful for the development of trees because concrete and bituminous roads do not pass water through its entire body.

In pervious concrete, the amount of materials required for making pervious concrete is carefully controlled like water and cement. The concrete creates the void in it .it allows water from its entire structure.

II. METHODOLOGY

A) Preparation of Cube Specimens

1. Take mix proportion of water, aggregate and cement while concreting.
2. Fill concrete in three layers.
3. Compact each layer[35 nos]
4. Finish top surface by using trowel.

b) Mixing

Mix concrete by using trowel by manually or using concrete mixer.

C) Sampling

- 1) Clean the moulds by using brush and apply grease.

- 2) Fill the mixture of concrete in the moulds in 3 equal layers
- 3) Compact every layer of concrete by using temping rod at least 30 to 40 times.
- 4) The mould will fulfill with concrete by using trowel. Curing the concrete mould and place it room temperature for 1day for better results.

D) Curing

The concrete mould are place in room temperature for 1 day for better result .after that release the mould and concrete block sock in water for carrying out test.

E) Procedure:

1. The unit weight and void ratio are the important factors to be considered in mix design.

According to mix design the quantity of cement for one cubic meter of porous concrete

The other consideration is aggregate to cement A/C ratio and W/C ratio.

The mix design procedure gave the value of cement to aggregate ratio C/A for size of aggregate crossing on minimum 20 mm is sieve. .

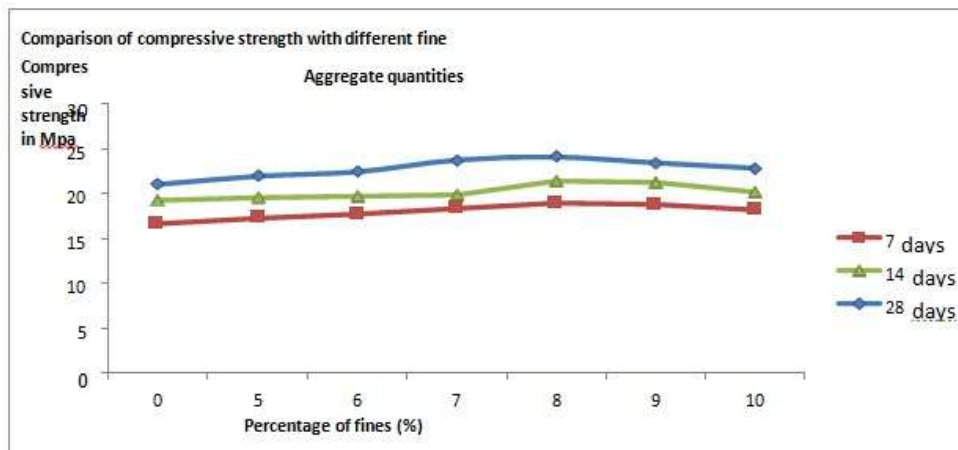
The W/C Ratio for porous concrete should be range of 0.25 to 0.36. .

- a) For the proper working select the W/ C ratio as0.3.
- b) Calculate the void ratio of porous concrete and unit weight range..

III. RESULTS AND DISCUSSION

Table-1: Compressive strength of pervious concrete with different quantities of fine aggregate

S.No	Age of concrete	Standard pervious concrete(0% fines), MPa	concrete with 5% fines, MPa	concrete with 6% fines, MPa	concrete with 7% fines, MPa	concrete with 8% fines, MPa	concrete with 9% fines, MPa	concrete with 10% fines, MPa
1	7	16.70	17.35	17.76	18.36	18.96	18.74	18.26
2	14	19.24	19.62	19.75	19.95	21.48	21.25	20.27
3	28	21.07	21.96	22.47	23.79	24.13	23.47	22.87



IV. CONCLUSION

- The size of coarse aggregates, W/C ratio and aggregate to cement ratio plays a crucial role because it increases the strength of concrete.
- The two important parameters of pervious concrete is unit weight and void ratio in mix design.
- Among the two methods of increasing strength of porous concrete, the addition of fines has gave more value when compared to replacement of cementitious materials.
- The addition of fines and replacement of Cementitious will reduce the permeability capacity of pervious concrete.
- The compressive strength of pervious concrete is increased by 4.35% when 5% fine aggregates were added to the standard pervious concrete.
- The strength of concrete is increased by 6.67% when 6% fine aggregates were added to the standard pervious concrete.
- The strength of concrete is increased by 12.96% when 7% fine aggregates were added to the standard pervious concrete.
- The strength of concrete is increased by a maximum of 14.59% when 8% fines were added to standard pervious concrete.
- The strength concrete is increased by 11.47% when 9% fine aggregates were added to the standard pervious concrete.
- The compressive strength of pervious concrete is increased by 8.59% when 10% fine aggregates were added to the standard pervious concrete.
- The compressive strength of pervious concrete is increased by 8.59% when 10% fly ash was replaced in the place of cement.
- The compressive strength of pervious concrete is increased by 3.78% when 5% fly ash was replaced in the place of cement.
- The coefficient of permeability is decreased by 22.54% when 8% fines are added to standard pervious concrete.
- The coefficient of permeability is decreased by 51.96% when 10% fines are added to standard pervious concrete.
- The coefficient of permeability is decreased by 42.15% when 10% cement is replaced by Fly ash in standard pervious concrete.
- Hence it is recommended that addition of 8% fine aggregates to the pervious concrete will satisfy, both strength of concrete and permeability of concrete.

V. REFERENCES

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