RECHARGING PHREATIC ZONE THROUGH PERVERIOUS CONCRETE PAVEMENT

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COLLEGE : SHRI MADHWA VADIRAJA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, BANTAKAL
BRANCH : DEPARTMENT OF CIVIL ENGINEERING
GUIDE : MR. PRADEEP K M
STUDENTS : MR. PRADEEP K M.
          MR. PUNEETHKUMAR N.
          MS. LAXMI M. BYALYAL
          MS. CHAITHRA

Introduction:
The pervious concrete system and its corresponding strength are as important as its permeability characteristics. The strength of the system not only relies on the compressive strength of the pervious concrete but also on the strength of the soil beneath it for support. Previous studies indicate that pervious concrete has lower compressive strength capabilities than conventional concrete and will only support light traffic loadings. This project conducted experimental studies on the compressive strength on pervious concrete as it relates to water-cement ratio, aggregate-cement ratio, aggregate size, and compaction. Since voids are supposed to reduce the strength of concrete, the goal is to find a balance between water, aggregate, and cement in order to increase strength and permeability.

Pervious concrete pavement is unique and effective means to meet growing environmental demands, by capturing rainwater and allowing it to seep into the ground.

From Various literature reviews we conclude that climate change means that incidences of ‘extreme weather’ are becoming common place. Increasingly frequent bouts of heavy rain fall should be anticipated as the norm rather than the exception, and in conjunction with our increased rate of urban development, this means that risk of flooding is rapidly increasing. Pervious concrete allows the water to percolate through the concrete into the sub-base and recharge the underground water level. Voids within the pervious concrete should be interconnected so as to create channels through which water can freely flow. The advantages of pervious concrete can be classified into three basic categories: environmental, safety and economics. Pervious concrete pavement is a unique and effective means to meet growing environmental demands. By capturing rainwater and allowing it to seep into the ground, pervious concrete is instrumental in recharging groundwater, reducing storm water runoff. Although not a new technology but definitely in India pervious concrete is receiving renewed interest.

Objective:
The main objective of this project is to develop a strong and durable pervious cement concrete mix by varying the quantity of fine aggregates, without affecting the permeability. To find the effect of fine aggregate on density and strength properties of no fines concrete. To find optimum mix for no fines concrete based on strength criteria. The goal is to achieve a maximum
compressive strength without inhibiting the permeability characteristics of the pervious concrete. And also,

- Savings in transporting and handling precast units on site.
- To improve the quality of landscaping and to reduce the need for watering.
- To recharge the ground water level.
- To investigate the performance characteristics of the pervious concrete such as porosity, compressive strength, infiltration rate etc.
- To increase the aesthetic appearance of the pavement.

**Applications of pervious concrete**

- Pervious concrete as a road pavement.
- Low-volume pavements.
- Sidewalks and pathways.
- Residential roads and driveways.
- Parking lots.
- Noise barriers.
- Hydraulic structures.
- Swimming pool decks.
- Tennis courts.

**Conclusion:**

- Finally the first mix is used for road construction in low traffic road.
- Thus the pervious concrete will have its complete usage as the pavement.

**Future scope of research in the area of pervious concrete pavement:**

- Performance of aggregate inter lock joint over time.
- Injection well.
- Field Performance study under heavy loads.
- Fatigue relationship for pervious concrete.
- Feasibility of using more cement.
- Different aggregate gradations.