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A Review on Partial Replacement of Rubber in Concrete & Brick Production

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ABSTRACT: Rubber is not a decomposable material and from rubber various disease are generated. And we use this rubber in our brick and concrete as a construction material. Because of rubber is reusable material but not decomposable and hence it reused. When the building is constructed from rubber mix concrete and brick after his lifespan it will demolishing and then the wastage of bricks and concrete which is rubber mixed it is reuse in the other construction of building.

Rubber is injurious to health and hence rubber is use in the walls and any other construction. Because of the wall and constructed material is not injurious and it is useful. Thus the rubber decreases in environment.

I. INTRODUCTION

The tyre industry is keen to develop a market for recycled tyre products. This project aimed to determine the optimal use of crumb rubber produced from end-of-life tires as a partial replacement for natural sand aggregate in concrete, thus generating a new product known as crumb rubber concrete. Crumbed rubber concrete (CRC) is a promising new material on the construction scene. Created by replacing sand with rubber particles when mixing concrete, the material promises to significantly reduce certain environmental impacts, yet its structural properties are still relatively unexplored.

The rubber mixed brick is useful for construction in Civil Engineering. This brick is use in internal construction wall. Rubber, cement and sand are used in this brick. The brick Modern rubber cements are acid-free, making them ideal for archival purposes. Rubber cement thinners are also available, and are used to replace the solvent that evaporates from the container or to remove residual adhesive.

Crumb rubber can be a lightweight substitute for mineral aggregates as its density is less than half of that of mineral aggregate. Mineral aggregates have a unit weight or density ranging between 1600 and 2080 kg/m³ while crumb rubber unit weight or density ranges between 640 and 720 kg/m³.

Objectives-

1. Rubber is replaced material to the aggregate.
2. Reusable material.
3. Rubber is light in weight as compare to aggregate.

II. METHODOLOGY

For this dissertation work it is proposed to carry out the work in the following phases

Phase I: Collection of information through literature review and or preliminary study on site.

Phase II: Collection of data through questionnaires' devised in the same regards.

Phase III :Finding over engineering in different projects by comparing data collected Phase

IV: Develop a model to assess the over engineering in a construction project.

Phase V: Validation of the model for selected case study

III. LITERATURE REVIEW

1. Tushar R More, Pradip D Jadhao and SM Dumme

In their study the aim was to study of waste tyre as partial replacement of fine aggregate to produce rubberizes concrete in M25 grade of mix. Different partial replacement of crumb rubber i.e., 0%, 3%, 6%, 9% and 12% by volume of fine aggregate are casted and tested for flexural strength and split tensile strength. The result shows that there is a reduction in all type of strength for crumb rubber mixture, but crumb rubber content concrete become more lean due to increase in partial replacement of crumb rubber as fine aggregate ie., 3%, 6%, 9% and 12%. Flexural strength of concrete decreases by 3% replacement of sand, further strength is decreased with the increase in percentage of crumb rubber. For split tensile strength decreases with 3% replacement of sand and further decrease in strength with the increase in percentage of crumb rubber. This is mainly due to lower bond strength between cement paste and rubber tyre aggregate.

2. Prof. M. R. Wakchaura and Mr. Prashant. A. Charan

In this study they did partial replacement of fine aggregate as crumb rubber as 0.5%, 1%, 1.5% and 2% in M25 grade of concrete and its effects on concrete properties like compressive strength, flexural strength were investigated. Addition to this combination of glass fibre at ratio 0.4% and 0.5% addition to the weight of cement are used to regain the reduced strength due to use of waste tyre crumb rubber particle. Results indicate that replacement of waste tyre crumb rubber particle to the fine aggregate in concrete at ratio 0.5% and 1% there is no effect on the concrete properties would occur, but there was a considerable change for 1.5% and 2% replacement ratio.

3. Er. YogenderAntil

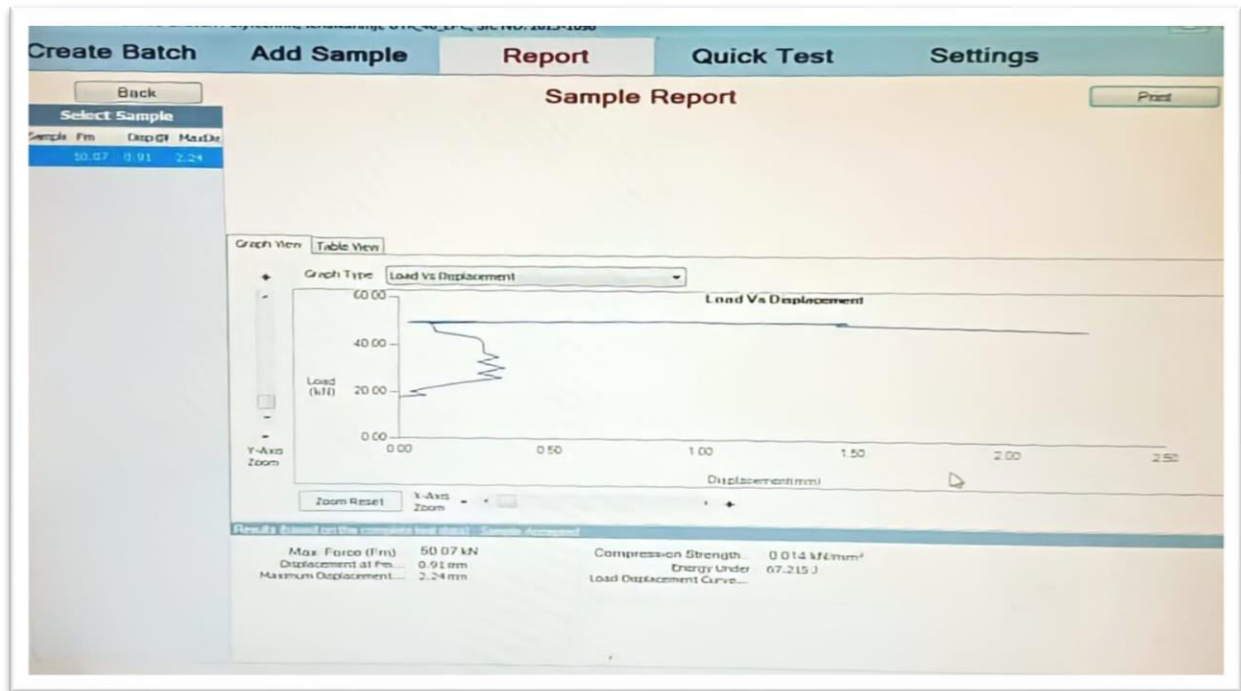
The primary objective of their investigation is to study the strength behaviour i.e., compressive strength and flexural strength of rubberised concrete with different volume of crumb rubber. Parameter to be varied in Investigation is volume variation of crumb rubber. The proposed work is aimed to study the effect of volume variation of crumb rubber on the compressive strength, flexural strength and slump test. So they founded that strength of modified concrete is reduced with an increase in rubber content. The Flexural strength of the concrete decreases about 69% when 20% of sand is replaced by crumb rubber. The compressive strength of the concrete decreases about 37% when 20% of sand is replaced by crumb rubber So overall large percentage of crumb rubber the lower the compressive strength and flexural strength as compared to conventional concrete.

4. Nithiya P and Portchejian G

In this research paper the mix design was done as per IS: 10262-2009 to achieve the target strength. The concrete mixes were made by replacing fine aggregate with 5%, 10%, 15% and 20% for M20 grade concrete. So they founded that compressive strength decreases with the replacement of crumb rubber increased and 5% replacement of crumb rubber proves exceptionally well in compressive strength and tensile strength. It also gives more strength at 28th days for 5% replacement for M20 grade of cement and split tensile strength decreases at the maximum at the maximum of 25% when crumb rubber is replaced up to 10% of fine aggregate. Thus by replacing fine aggregate by crumb rubber safeguards the environment

IV. RESULT

- 1] The compressive strength of rubber mix concrete of 7 days is 14 N/mm²
- 2] The compressive strength of rubber mix concrete of 14 days is 20 N/mm²
- 3] The compressive strength of rubber mix concrete of 28 days is 22.5 N/mm²



V. CONCLUSION

1. The strength of concrete is increased by the use of rubber.
2. The total weight of concrete for this method is reduced to greater extent.

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