

REUSE OF WASTE BRICK AS A SUSTAINABLE CONSTRUCTION

MATERIALS: A REVIEW

Asst. Prof. N.N.Ingale

PES’S College Of Engineering Phaltan

Civil Engineering Department

Nilingale11@gmail.com

Abstract

The application of recycled clay brick can not only solve the disposal problem of demolished solid waste but also reduce ecological environment damage caused by the excessive development of resources. The eco-friendly brick is made from recycled industrial waste materials, an environmentally and economically sustainable alternative to clay fired bricks. The application of recycled clay brick can not only solve the disposal problem of demolished solid waste but also reduce ecological environment damage caused by the excessive development of resources. The eco-friendly brick is made from recycled industrial waste materials, an environmentally and economically sustainable alternative to clay fired bricks. Several million tons of solid waste are produced each year due to construction and demolition activities world wide, and brick waste is one of the wide twastes.

Recently, a growing number of studies have been conducted on using recycling brickwaste(RBW)to produce environmentally friendly concrete.

These of brick waste(BW)as potential partial cement or aggregate replacement materialis summarized in this study.It involves a compressive strength test to compare RBA concrete and conventionalconcrete. Trial mixes of RBA concrete were prepared by replacing with 20%, 40%, &60% crushed bricks by volume.

Introduction (TNR -12)

The application of recycled clay brick can not only solve the disposal problem of demolished solid waste but also reduce ecological environment damage caused by the excessive development of resources. The eco-friendly brick is made from recycled industrial waste materials, an environmentally and economically sustainable alternative to clay fired bricks. Several million tons of

solid waste are produced each year due to construction and demolition activities world wide, and brick waste is one of the widest wastes.

Recently, a growing number of studies have been conducted on using recycling brick waste (RBW) to produce environmentally friendly concrete. The use of brick waste (BW) as a potential partial cement or aggregate replacement material is summarized in this study.

The concept of sustainable development includes energy conservation, environmental protection, and protection of nonrenewable natural resources. Because of limited landfill space and costly natural aggregates, the application prospect of crushed clay bricks as a new civil engineering material must be investigated. Waste reuse and recycling is a method of energy conservation in modern society. Reuse of clay bricks as aggregates not only reduces the problem of waste storage but also helps to preserve natural aggregate resources.

OBJECTIVES

- To study the suitability of recycled brick as cement replacement to natural coarse aggregate.
- To study the behaviour of compressive strength.
- Make a suitable concrete for construction by using brick waste.
- To promote sustainable development and minimize the exploitation of finite resources.

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LITERATURE REVIEW

1. Naraindas Bheel, K Rajesh Kuma, Ashok Kumar, Rehana Bhagam, Adeyemi Adesina, Shanker Lal Meghwar and Noor Ahmed Memon “Innovative use of brick wastes as coarse aggregate in concrete” Coarse aggregates occupy the largest volume in concrete which is one of the most widely used construction material as per industry surveys. The depleting supply of coarse aggregate coupled with the high greenhouse gas emissions from its processing and transportation has resulted in a need to find alternatives that can be utilized as coarse aggregate. Of such materials that are available in abundance locally in Pakistan are brick wastes that are generated from the construction and demolition processes. In order to evaluate the feasibility of using brick wastes as coarse aggregate in producing concrete, this study was undertaken. Six concrete

mixtures were made by incorporating brick wastes as a replacement for the natural coarse aggregates and the corresponding properties evaluated. The properties evaluated are the slump, density, compressive strength and flexural strength. Results from this study indicated that the use of brick wastes as coarse aggregates in concrete resulted in a decrease in the slump and mechanical properties. However, concrete mixtures incorporating brick wastes up to 100% replacement of natural coarse aggregate exhibited flexural and compressive strength higher than 2 MPa and 10 MPa respectively.

3. Duaa Jabbar Abdullah, Dr. Zena K Abbas, Dr. Suhair kadhem abed

“Study of Using of Recycled Brick Waste (RBW) to produce Environmental Friendly Concrete”

Study of Using of Recycled Brick Waste (RBW) to produce Environmental Friendly Concrete Several million tons of solid waste are produced each year due to construction and demolition activities worldwide, and brick waste is one of the widest wastes. Recently, a growing number of studies have been conducted on using recycling brick waste (RBW) to produce environmentally friendly concrete. The use of brick waste (BW) as potential partial cement or aggregate replacement materials is summarized in this review, where the performance is discussed in the form of the mechanical strength and properties related to the durability of concrete. It was found that, because of the pozzolanic activity of clay brick powder, it can be utilized as a cement substitute in replacement levels up to 10%. Where as for natural coarse aggregate, recycled aggregate can be used instead of it, but at a limited replacement level. Concrete manufacturing from recycled aggregate can give adequate strength and can be suitable for producing medium or low strength concrete. On the other side, the utilization of fine recycled brick waste as aggregate in concrete manufacturing provides development of the properties of concrete. It develops the durability of concrete in some cases when used with replacement level up to 10% by the weight of fine aggregate.

4. Farid Debib and Said Kenai studied the effect by partially replacing the studied the effect by partially replacing the fine and coarse aggregate with crushed clay brick in concrete.

The compressive strength and split tensile tests were conducted on concrete at the replacement levels of 25, 50,75 and 100%. The authors reported a relatively low density for crushed brick concrete than normal concrete. The substitution levels of 25% for coarse aggregate and 50% for fine aggregate were ported from the test results.

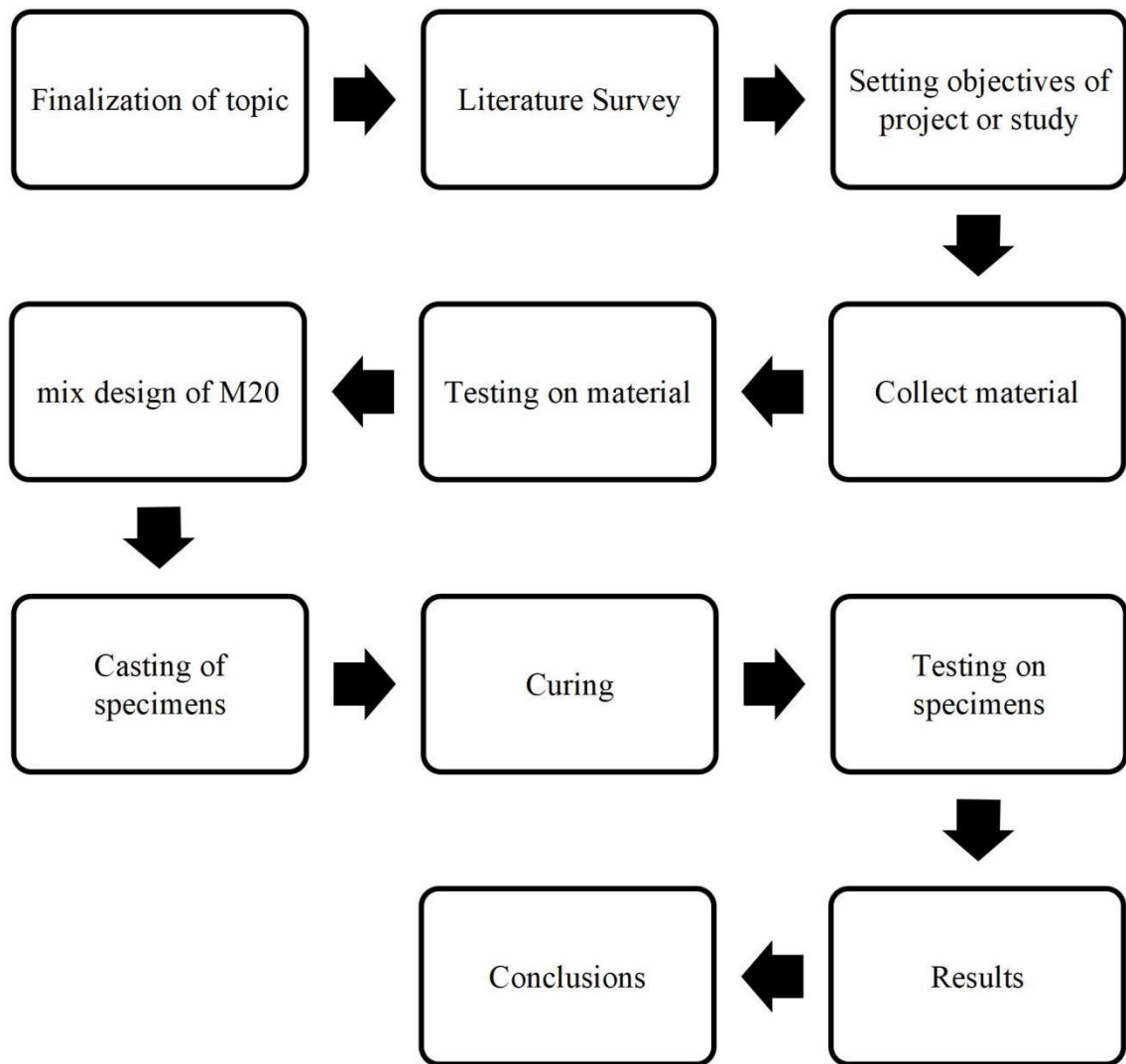
and split tensile tests were conducted on concrete at the replacement levels of 25, 50,75 and 100%. The authors reported a relatively low density for crushed brick concrete than normal concrete. The substitution levels of 25% for coarse aggregate and 50% for fine aggregate were ported from the test results.

5.Vikash Kumar Gautam, Mr. Devesh Jaysawal “Use of over burn crushed Brick as Coarse Aggregate in Concrete mix”

The study during this paper is administered to check the practicability of exploitation crushed overburn bricks to alternate the coarse mixture (gravel) in concrete. 2 kinds of concrete intermixture are ready. the primary one may be a mixture of 1:2:4 while not crushed over burn bricks and is employed as a reference mixture. The other is formed of various weight of crushed over burn bricks (as a proportion from the load of the coarse aggregate). a complete of thirty numbers of concrete specimens are casted with and while not crushed over burn bricks and tested below compression and split tension as per relevant to British commonplace specifications. Take a look at results indicated that mistreatment crushed bricks reduces the strength of concrete. Also, the proportion of water to cement magnitude relation will increase for constant slump once the proportion of crushed bricks augmented. The results indicate that the crushed over burn brick are appropriate to switch the granite mixture in concrete production.

Trial mixes of crushed over burn brick concrete were by substitution the Granite Aggregate with 25%, 50%, 75% and 100 percent crushed over burn bricks by volume. M20 grade of each Granite aggregate and crushed over burn brick concretes were ready and tested to match the compressive strength. The take a look at results showed that it's do able to provide crushed over burn brick concrete with characteristics like those of Granite aggregate concrete with 25 % replacement.

Methodology



Conclusion

The recycled brick waste (RBW) together with partial replacing a part of natural aggregate in the specified concrete mixture composition are declared as materials suitable for the production of concrete.

Compressive strength of recycled brick aggregate is decreases with increase in percentage of replacement.

RBA is suitable for parking area, partition wall, footpath; cycle path etc. By using this method waste can be optimized it is good for sustainable development.

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