

Comparative study on red brick v/s lightweight concrete block

Mayuri Kanekar¹, Pooja Kale², Priya Dhok³

1(Department of civil engineering, RTMNU/Smt. Radhikatai pandav college of engineering, Nagpur

2 (Department civil engineering, RTMNU/Smt. Radhikatai pandav college of engineering, Nagpur

3 (Department civil engineering, RTMNU/Smt. Radhikatai pandav college of engineering, Nagpur

Abstract:

The construction material used in building causes pollution during their manufacture. In this paper we aim to show a comparative study between red bricks and light weight blocks and their effort on the environment. Red bricks are one of the traditional building materials that are being used widely in construction industry. Solid waste management is one of the most important techniques in today's global manufacturing plot. This project is done of utilizing the waste for constructive purpose under eco-friendly environment. Foam concrete is one of the types of lightweight concrete. Any coarse aggregate does not contain in this type of concrete. Lightweight-foamed concrete is use in low strength capacity. Workability is high and low self-weight of this concrete.

Keywords — foam concrete, red bricks, fly ash, aluminum powder

I. INTRODUCTION

Foam concrete has been developed in Europe. Since then, international markets have been running for more than few years. Concrete is most important construction materials. It is material used in structural construction. Lightweight concrete (LWC) that kind of concrete; this includes an extended agent, which growths mixture while increasing the soft weight. It is weightless than normal concrete. In a lightweight, the main point of concrete is the low density and low thermal perforation. A proportion was done for M₂₀ concrete by using Indians Standard method. OPC 53 grade, fly ash is made by mixing fly ashes with cement, sand and water. LWC is mostly used in impetration such as concrete masonry unit's i.e. Concrete blocks. LWC is usually chosen for structure purpose where its use wills dead load to a lower overall coat of a structure than red brick this research report is prepared to study comparison between red brick and lightweight block.

Objective

- To provide enough strength.
- To provide low density.
- For low dying shrinkage

II. LITERATURE REVIEW

Prashant Gautam , Navdeep Saxena "comparison between autoclaved aerated concrete blocks(AAC) and Red Bricks" (IJERT ISSN : 2278-0181, ISSUE 10, OCTOBER 2013).

In this paper, present the comparative studies between the red bricks and AAC blocks and their environment effects. This study is gives the first preference to greener and efficient construction material and autoclaved aerated concrete is the green material. It does not only used waste product like fly ash and it is provided the enough strength to the structure, this result gives the dry density of AAC blocks is less than the red bricks that reduces the dead load on the structure and the compact power of the red bricks is more than AAC block, resulting it is gives greater strength.

Dhrumil s. chokshi , Ashish H. Makwana " Study on comparsion of fly ash bricks and clay bricks (ISSUE 5, DECEMBER 2013)

In this paper, compare between fly ash bricks and normal bricks. Both fly ash brick and normal brick wall data are collected and then result specified can be complete by using statistical method. fly ash , lime , gypsum, sand are used to made fly ash bricks. This brick is used in the constructional building material and same as that of normal brick .fly ash bricks are strong and less in weight than normal brick.

Jayesh Pitroda , Mayur Kumar Patoliya, “techno-economical study of fly ash ,lime ,gypsum bricks in the central region of gujrat –india”,sardar Patel university,vallabh vidyanagar-gujrat (2012).

In this research author said that, fly ash are made by large-scale thermal power plant global agricultural and active expansion of agricultural-based industries. As a result, a more amount of agricultural waste is unfortunately not always good management or utilisation. This waste can be recycle, such as removing the fibres and releasing the leaves and fruits milk and then making bricks in it. The current study aims to check the strength and efficiency of fibre fly ash brick and water and fly ash.

Ashish Kumar Parashar , Rinku Parashar “compare the strength of the bricken” (2012).

In this paper author said that comparison of compact strength on the bricks, that is why the various categories of material were added to different weight categories purpose and compact strength of the requirement were form, and then help of graph compare between compact strength of bricks, made from rice peel, cement wood ash, clay, fly ash are determine.

Rajive Bhatt, Dr. F S Umrigar, Indrajit Patel, Jayesh Pitroda “Techno- economical study of fal-g bricks” (2010).

In this paper author said that fly ash, lime, gypsum bricks FAL-G are slowly replacing by normal brick for wall constructions. It is ecofriendly material FAL-G bricks need for the

achievement of sustainable development, as per the FAL-G bricks of one statistics, 30 million tons of fly ash will be used by 10% . Fly ash brick every year and also it will save the environment and coal and income benefit by a ways to reduce in brick cost production by 300 corer.

Dr. L. B. Zala , Dr.F. S. Umrigar (2010)

Author said that present the fly ash brick are best than normal bricks are more useful for construction industry. The study, as construction material, it is the production sources of fly ash at global level. The range of 50 to 112 million tons is used. Use up to be 38% to 85 %. 138 million tons fly ash is produced by India with 38 % of its utilization. Fly ash reduces environmental problem and the cost of construction is less.

III. MATERIAL PROPERTIES

A. MATERIAL USED IN LIGHTWEIGHT CONCRETE

- Cement: cement is an important product of concrete that act as a binding agent. Normal Portland cements generally prefer more on cement type. OPC are used in investigation.
- Water: the water is used which must customize according to the general requirement of concrete.
- Fly ash: fly ash is creating by coal or other substances burned and carried into the air. Two categories of fly ash are normally used in concrete siliceous fly ash (class F) and calcareous fly ash (class C). Fly ash is used an important raw material in the manufacturing of LWC.

• Aluminium powder:

Used as an aluminium powder foaming agent. Aluminium is the most widely specified metal in the building. Aluminium is added 0.2% to 0.5% by dry weight of cement to the mixing. Aluminium is available in various forms. For the LWC industry, the most used forms powder and paste. Used as aluminium pharmaceutical agent for LWC preparation.

Chemical and Physical properties of aluminium:

Molecular formula: Al

Colour : silver

Density: 2.7g/ml at 25°C (77°F)

Form : powder

Melting point: 660°C (1220°F)

Oder : odourless



Fig.1 foam concrete

IV. METHOD OF FOAM CONCRETE

The course does not get a total of foam concrete, and can be known as a carbon dioxide. Generally, aerated generated solid air or other gas is used in cement slurry and fine sand.

There are two stages to creating the aerated concrete.

The first stage is to inject gas into the gas during the chemical stages of the chemical process.

The second stage, by blasting the air with the use of an agent that mixes gas in a steady form or with an air pollutant. The first stage is mostly used in strict concrete factories where precast units become self-sufficient to generate concrete with reasonable high power and low death insulation. The second stage is manually used in-situ concrete, useful for insulation roof screens or pipe jam.

Lightweight is a solid LWC version that, according to surrounding environment, generated like concrete. The mixture of fly Ash, cement, sand and water makes it, which combine with the addition of pre-formed foam in an ordinary concrete made under wide position. The mixture is pumped or framed as the assembled mould or reinforced structural component of the square block or placed on flat roof or vacancies for thermal insulation or filling. Giving foam slurry to the free flow of foam bubbles with all bearing so that it is easily accessible in all corners and compression automatic in the block without the need of any kind of compaction.



Fig.2 red bricks

Red Bricks	Light weight concrete
The mixture of sand, clay, lime, magnesia, and iron oxide makes it.	The mixture of cement, sand, fly ash, aluminium powder, makes it.
Maintains is low and it is durable.	Maintains is low and it is durable.
Fire resistance is high.	Fire resistance is high.
The bricks colour is Red.	The bricks colour is Grey.
Dry density is 1821-1920kg/m3.	Dry density is 300-1850kg/m3.
It is depend on size of bricks and density.	It is depend on size of blocks and density.
Cost is more.	Cost is less.
It is not eco friendly.	It is eco friendly.
Its shape is uneven.	Its shape is uniform.
Red bricks weight is heavier.	Lightweight concrete weight is lighter.

V. COMPARATIVE RESULT OF RED BRICK VS LIGHTWEIGHT CONCRETE

A. Advantages of red brick

- Economical
- Durable and hard
- Compact strength is good.
- Maintenance cost is low.
- Highly fire resistant
- Pollution is less during manufacture.

B. Disadvantages of red brick

- Time-consuming construction.
- Tensile strength is less.
- The Brick do not used in earthquake zones when it high.
- A clean ear band is strong task
- It a narrow surface is reduced, than it is slightly increases.
- Brick easily absorb water that is why it reason fluorescence when not exposing to air.

C. Advantages of light weight block

- Excellent fire resistance
- Light weight block are eco friendly
- Lightweight blocks are not affecting by harsh climatic condition.
- Lightweight blocks help in the faster construction of building as they is easy to install.

D. Disadvantages of light weight block

- More care is need for maintains water content, mixing, and supervision.
- It is sensitive with the water content in the mixture.
- Mixing time is more than normal concrete.

VI. CONCLUSIONS

- Fly ash is making in different proportion it is see that, as percentage is increase density is also increased.
- Fly ash constitutes is the important material for lightweight blocks which is the waste induct obtained from thermal power plant.
- The dry density of lightweight block is less than red brick; it is decreases the dead weight on the structure.
- Result in lack of considerable cost of its take a more distance than the small cubes.
- The normal bricks are heavier than LWC blocks.
- Speed of completing the process is also less.

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