

Review on Optimum Energy Consumption for Low Cost Green Building

Mr. Piyush Radheshyam Nimje¹, Prof. B.J.Godbole²

¹Student, Master in environmental Engineering, G.H.Raisoni college of engineering, Nagpur

²Assistant Professor, Department of Civil Engineering, G.H.Raisoni college of engineering, Nagpur

Abstract- Houses have major impact on energy use and the environment also it is a major energy consuming sector. Buildings are major cause of climate change and energy security. In India, Houses consumes more than 40% of country's energy and responsible for almost 40% of greenhouse gas emissions. Now a day demand of houses increase which leads to consumes more energy, raw materials and resources which raise the carbon content in air and which are harmful to environment and human health. The review will be used to help for optimum energy utilization for Low cost Green Building. The study will be carried out to provide Low cost green building design implementations by using energy resources which help to reducing the waste and pollution by providing effective energy method. This review paper mainly focuses on energy consume by using zero electricity air conditioning using phase changing material which help for raising the temperature to 5°C. Energy is saving by materials used in construction of college building situated in Kalyan and Badlapur (West) city of Thane district in Maharashtra. Also energy consume by providing vertical gardening and Thermal Insulation to Reduce Heat Loss.

Index Terms- Zero air conditioning, thermocol sheet inner wall covering, vertical bottle gardening.

1. INTRODUCTION

Green building refers to both a structure and the application of processes that are environmentally responsible and resource-efficient throughout a building's life-cycle: from planning to Design, Operation, Construction, Maintenance, Renovation and Demolition.

Transparency, Natural Day-lighting is a useful advantage for glass. Glass can play a role in greater indoor environmental. Different rating systems adopted for evaluation of parameters of green

buildings are Rating Systems IGBC/LEED (India), BREEAM (UK), CASBEE (Japan), LEED (US), DGNB (Germany), GREENSTAR (Australia). Leadership in Energy and Environmental Design (LEED) is a rating system devised by the United States Green Building Council (USGBC) to evaluate the environmental performance of a building for the following certification. Certified (40-49 points), Silver (50-59 points), Gold (60-79 points), Platinum (80-100 points).

2. LITERATURE REVIEW

1. ZERO ELECTRICITY AIR CONDITIONING USING PHASE CHANGING MATERIALS

(By Akshansh Mishra et.al (Jan-June 2016))

Zero Electricity Air Conditioning consists of Thermocol Sheets, Small Strands, and Phase Changing Material, Bottle Cans. This method can reduce temperatures in the home by up to 5°C.

It is used in rural areas where air conditioning is necessary at low cost. Zero Electricity Air Conditioning is an effort to give low cost air conditioning effect by using common waste item.

To make this Zero Electricity Air Conditioning cooling system, plastic bottles are cut in partially and then mounted into a network through bottlenecksized holes. The grid can be located over a window with the narrower top end of the bottle facing inwards side. When the wind blows through the bottles, cool air passed into the cabin to reduce the inner room temperature up to 5°C.

2. OPTIMIZATION OF ENERGY IN PUBLIC BUILDING

(By Krishna A. Joshi et.al (Nov-2013))

The public buildings such as schools, offices, and colleges consume a large amount of natural resources and energy. This paper mainly focuses on energy of materials used in construction of college building situated in Kalyan and Badlapur (West) city of Thane district in Maharashtra for the comparison with unlike alternative materials in order to reduce the energy of building.

Flash bricks replaced by clay bricks reducing consumption of energy by around 74.6%. , AAC blocks reduces energy consumption by 45%., The use of PPC replaced by OPC reduces energy consumption by 33 %, The use of Kota stone reduces energy consumption by 7% and carbon emissions by 1.6% when compared to Terrazo tile with increase in cost by 13%.

3. Vertical Gardens – An Innovative Element of Green Building Technology

(by Piyush Sharma)

This paper mainly focuses on the growing your plants upwards on vertical surfaces, vertical gardening is more than just aesthetics. It also helps to save water by reducing the need for irrigation and watering with vertical greenery, it also helps to soften the grey, hard. It can help to cool and insulate buildings, reducing the need and cost for air-conditioning.

4. VERTICAL GARDEN

(By MAGDALENA CHUDY, (2014))

This paper mainly focuses on the green walls also known as vertical gardens .Is the right solution for implementing greenery in places where it is necessary because of the low quality of the environment. Vertical gardens confirm their great usefulness in a city and have big and positive environmental effect.

5. A Review on Thermal Insulation and Its Optimum Thickness to Reduce Heat Loss

(By Gopal Sahu et al, (November 2015))

In this paper we studied that Insulation is used in buildings and in manufacturing processes to prevent heat loss or heat gain. This paper gives the detailed study of insulation materials needs in respect to economic.

3. CONCLUSION

The buildings sector has major opportunity to optimize the energy utilization on both new and existing buildings so it is necessary to focuses on energy consuming methods. This paper help to save the energy by decrease temperatures in the home by up to 5°C using Eco-Cooler, different alternative materials in order to reduce the energy of building at different percentage such as flyash bricks replaced by clay bricks consumption of energy by around 74.6%. AAC blocks reduce energy consumption by 45%. The use of PPC over OPC reduces energy consumption by 33 %. The use of Kota stone reduces energy consumption by 7%. Also energy consume by providing vertical gardening and Thermal Insulation to Reduce Heat Loss.

REFERENCES

- [1] “ZERO ELECTRICITY AIR CONDITIONING USING PHASE CHANGING MATERIALS.” By Akshansh Mishra et.al, Jan–June 2016, International journal of thermal engineering (IJTE) Volume 4, Issue 1,ISSN: 2347-3932, pp. 10–14.
- [2] OPTIMIZATION OF ENERGY IN PUBLIC BUILDING by Krishna A. Joshi et.al, (Nov-2013),IJRET, eISSN: 2319-1163 | pISSN: 2321-7308,pp 423-427.
- [3] Vertical Gardens – An Innovative Element of Green Building Technology by Piyush Sharma,pp 42-48.
- [4] “VERTICAL GARDEN”,by MAGDALENA CHUDY,2014,pp6- 9.
- [5] “A Review on Thermal Insulation and Its Optimum Thickness to Reduce Heat Loss”, by gopal sahu et.al, ISSN (online): pp2349-6010.
- [6] ROLE OF NET ZERO ENERGY BUILDING IN ENERGY SECURITY by Santosh D Jadhav (June, 2015)
- [7] Design & Development of Solar Bottle Bulb & Mobile Charger by Mr. Bhawar Tushar Suresh et.al, (October 2015 - March 2016), International Journal of Mechanical and Industrial Technology, Vol. 3, Issue 2. ISSN 2348-7593, pp:(170-173).
- [8] “A Building Energy Efficiency Optimization Method by Evaluating the Effective Thermal Zones Occupancy .” ,by Anna Laura Pisello et.al,

Energies 2012, energies ISSN 1996-1073,pp 5257-527.

- [9] “Sustainable energy performances of green buildings: A review of current theories, implementations and challenges.” By Umberto Berardi et.al,2013,Elsevier,pp 1-17.
- [10] “User Evaluations of Energy Efficient Buildings.”By Å. L. Hauge et.al, 2010,pp 97-108.
- [11] THE TRANSITION TO LED ILLUMINATION: A CASE STUDY ON ENERGY CONSERVATION by NARENDRA B SONI et.al, (2005 – 2008), Journal of Theoretical and Applied Information Technology,pp 1083-1087.