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Comparison Study between Conventional Building and Sustainable Green Building

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Abstract— Sustainable green building should be preferred more as it is ecofriendly, pollution free and cost effective. New techniques should be taken into considerations which will help in design of sustainable building. Such design methods conclude why we should prefer sustainable green building rather than ordinary building.

So we have designed a sustainable green building using materials which are cost effective, pollution free and do not contribute to Green House Gases (GHG). And we have selected the location for construction of the sustainable green building taking into considerations all the parameters required for construction that is wind direction, wind speed, sunlight intensity etc. Thus we finally come to know why we should prefer a sustainable designed green building over ordinary building.

I. INTRODUCTION

Sustainable designed green buildings are required to be implemented in today's fast growing urbanization because due to fast developing infrastructure there is also addition of pollution to environment due to modern construction practices which harm the natural resources making imbalance in ecosystem which ultimately increase greenhouse gases pollution. So, bringing sustainable green building designed concept helps us to overcome all these problems and to make construction industry pollution free. Here we have designed two buildings one conventional and other sustainable green building, and we have compared both of them on the basis of cost of construction, materials used for construction and their impact on environment.

II. LITERATURE REVIEW

A. Title: Rooftop Rainwater Harvesting System - a Model based Approach

1) Author: Abhijit Zende, Baghawat P. B, Panhalkar N.M.

2) Abstract: In this Research paper they study the best way of utilizing the stored water for future use. The performance of rooftop Rainwater Harvesting evaluated on the basis of three main components such as reliability, resilience as well as the vulnerability. This technique seems to be cost effective and easier technique method for conserving the Rainwater water. They detailed study of potential of rooftop Rainwater Harvesting concepts of rooftop Rainwater Water Harvesting. This System modelling steps based on the steps with considering factors such as formulation, calibration/ verification and its applications. From this study they concluded that the policy recommendations related to applicability of Rainwater Water Harvesting schemes for meeting water crisis.

B. Title: Design and Economical of Rooftop Trusses and Purlins

1) Author: A Jayaraman, R. Geethamani, N. Sathyakumar, N. Karthinga shenbagam.

2) Abstract: This paper presents a study on behaviour and economical of rooftop trusses and purlins by comparison of limit state and working stress method. The design evaluated co-existing moments and shear forces of critical sections with same configuration. This study aims to provide economical method, high bending strength, high flexural strength, more load carrying capacity of the structure. By considering all parameters of the design of trusses from studying all parameters of design they concluded that working stress method is more economical than the limit state method of design.

C. Title : Green Building Materials - A Way Towards Sustainable Construction.

1) Author: Lakshat B. Mokal, Aladdin. Shaikh shamashree s. Raundal, sushma J. Prajapati.

2) Abstract: This paper studied the objectives for reducing the cost of the construction, environmental pollution through paying attention on parameters which are directly related to environmental pollution and high construction cost. This by reducing the construction cost by using cost effective green materials using more preference to eco-friendly construction materials. Energy efficiency.



III. METHODOLOGY

Here we have compared two buildings based on their cost of construction, environmental benefits, Materials used and also economy in construction. To compare them on the basis on price we have first found out their quantities of each and every material used in construction right from the start that is excavation in foundation till the finishing work. For finding out the quantities we have used centre line method of estimation (one can also use long wall short wall/PWD method) and for finding out the cost of materials we performed rate analysis by multiplying quantities of each material with their respective price according to the considered district's(PUNE) DSRs rate book, which was being published by PWD department. We thus found out quantities and ultimately costs of both the buildings and compared both of them. We also provided parameters like rain water harvesting, steel truss with proper design so as to give proper ventilation through sunlight and wind which makes the sustainable green building cost effective as well as environmental free.

IV. CONCLUSION

- A. We found out that the cost of ordinary residential building was more as compared to Sustainable green building.
- B. Carbon emission of RCC residential building was more than green building which had negligible carbon emission rate.
- C. Green building was more economical in construction moreover it did not have any adverse impact on environment as environmentally eco-friendly materials were used for its construction.
- D. Also using of renewable resources like rain water harvesting, steel truss with Mangalore tiles, use of the natural sunlight and wind through windows (properly designed for it) should good performance in case of internal as well as external atmosphere
- E. Thus comparison study showed that we should prefer Sustainable green building rather than ordinary RCC building.

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