

# Design and Analysis of a Residential Building Integrated with Green Building Concept - Literature Review

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## ABSTRACT

"The essential goal of this work is to the accentuation on basic plan of a structure (G+1) utilizing green idea with the goal that the structure stays solid all through its lifetime and fit enough to give a shed amid winter and summer."

**Keywords:** Energy, Green Building, Eco- friendly Housing.

## I. INTRODUCTION

present senior energy utilization has expanded a ton. The expansion in energy utilization is because of the expansion in the quantity of structure that is being built nowadays. The material that is utilized to manufacture a general structure now days for the most part comprises of non-sustainable materials which are neither durable nor Energy Efficient. These are wellbeing dangerous and less eco-accommodating as well. To the extent the financial analyst is the worry, however these material gives the low starting expense for making a structure yet prompts high energy utilization costs and a high support cost which brings about expanding the general expense of the structure. In this paper, we will watch the impact of a portion of the segment of the green structure like the rooftop, glass and so forth and its various types which is utilized to develop the green structures. And furthermore we will discover how much degree this green glass decreases the general power utilization of the structure when contrasted with ordinary glass by utilizing reenactment process(Using ECO-Nirman entire structure execution instrument programming) and at last get the upside of this Green house part over typical segment.

## II. LITERATURE REVIEW

### 1. Arijit Sinha 1 , Rakesh Gupta 1 , Andreja Kutnar DRVNA INDUSTRIJA 64 (1) 45-53 (2013)

Worldwide manageability objectives have prompted the improvement of the green structure development. The Green Building Program, originating from the development, has had exceptional accomplishment as it gives a quantifiable measurement to individuals' endeavors towards maintainable improvement. Manageable improvement and green structures are regularly utilized conversely. Albeit, manageable improvement and green structures are connected, they are not the equivalent.

This paper gives a review of how green structure identifies with supportable improvement rehearses. Maintainability additionally administers choices concerning building materials. A complete clarification of what comprises a green structure material is talked about and how sustainable material like wood admission in the choosing criteria. There are many green structure rating frameworks set up. US Green Building Council managed Leadership in Energy and Environment Design (LEED) is the

worldwide market pioneer in the rating frameworks. LEED is an excellent and stupendous exertion in moving towards supportable improvement by changing over the fabricated condition green. Be that as it may, it has certain traps and difficulties. A portion of these difficulties are as for arrangements on material se-lection and execution checking. The materials utilized in an undertaking are considered at a typical beginning stage and no thought is given to the existence cycle execution of the material. Proclamations concerning supportability require approval, and Life Cycle Analysis (LCA) is a device that can give such legitimacy. This paper exhibits how useful it tends to be, when included, in the greater plan of green structure rating frameworks and presents an inte-ground plan idea for green structures.

**2. Hemant Kumar 1 and Vaishali Sahu 2 Department of Civil & Environmental Engineering, ITM University, Gurgaon, Haryana, India Civil Engineering and Urban Planning: An International Journal(CiVEJ) Vol.2,No.2, June 2015**

The green structure idea is winding up increasingly more mainstream nowadays in light of the fact that these are considered as condition neighborly structure. The legislature is making fitting strides in usage of green structure ideas by giving increment in Floor territory proportion. They are making activity arrangement on environmental change on manageable natural surroundings by proposing savvy city ideas. Further notwithstanding that BEE is putting their exertion on apparatus naming system which helps in examination and leeway of substantial development ventures. A few corporate associations, organizations and development organizations are currently rehearsing green structure idea in the development. There are many green structure rating frameworks set up. GRIHA (Green Rating for Integrated Habitat Assessment) and LEED (Leadership in Energy and Environment Design ) was created in light of this need. The GRIHA is considered as Indian National Rating System which have been concluded in the wake of consolidating different alterations proposed by a gathering of modelers and specialists. US Green

Building Council directed (LEED) as the main green structure rating framework which is positioned first among different frameworks. LEED is contributing intensely in changing over the constructed condition towards feasible advancement. The structures which go under GRIHA are those which are having land region more than 2,500 Sqm. (with the exception of mechanical buildings). These structures can experience this confirmation program. The GRIHA doesn't cover structures having region under 2500 sqm so the present investigation centers around giving a rating framework to little private structures. By receiving this rating framework an ever increasing number of structures might be secured for supportable improvement. It gives a lift to close-by environment.

**3. M. Samer (Cairo University, Faculty of Agriculture, Department of Agricultural Engineering, El-Gammaa Street, 12613 Giza, Egypt) Agric Eng Int: CIGR Journal Vol. 15, No.2**

The "Green Building" is an interdisciplinary topic, where the green structure idea incorporates a large number of components, segments and strategies which wander to a few subtopics that entwined to shape the green structure idea. For the most part, the green structure is viewed as a natural segment, as the green structure materials are made from nearby eco-sources, for example ecologically inviting materials, which are then used to make an eco-development subject to an eco-plan that gives a solid environment based on the social and compositional legacy in development while guaranteeing protection of common assets. This guarantees dismantling the structure segments and materials, after a decided structure lifetime, to ecologically well disposed materials that can be either re-utilized or reused. Amid their lifecycle, the green structures limit the utilization of assets (energy and water); decrease the hurtful effect on the nature, and give better indoor condition. Green structures manage the cost of an abnormal state of ecological, financial, and building execution.

These incorporate energy proficiency and preservation, improved indoor air quality, asset and material effectiveness, and inhabitant's wellbeing and efficiency. This investigation centers around characterizing green structures and explaining their collaboration with the earth, energy, and indoor air quality and ventilation. Besides, the present examination researches the green structure materials (for example biocement, eco-bond and green solid), green plans, green rooftops, and green advancements. Furthermore, the present investigation features the green structures rating frameworks, the financial matters of green structures, and the difficulties that face the execution. In the end, the interdependency between the green structures and agribusiness has been examined.

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**4. Devarshi Tathaga, Dr.Ramesh D. Dod IOSR Journal of Mechanical and Civil Engineering (IOSR-JMCE) e-ISSN: 2278-1684,p-ISSN: 2320-334X, Volume 12, Issue 2 Ver. II (Mar - Apr. 2015), PP 01-09**

Change in atmosphere, brought about by the arrival of nursery impact causing gases (principally carbon dioxide) into the air, has been perceived as one of the best dangers of the 21st century. Offer of the worldwide energy utilization in India and China has additionally been on the ascent because of overwhelming industrialization, urbanization, populace blast, and concentrated development of IT. Structures are the prime energy purchasers in present day urban communities bookkeeping upto 40 to 45% energy utilization. Their utilization can be to a great extent kept through improving effectiveness, which is a compelling way to decrease ozone depleting substance discharges and moderate down consumption of petroleum products. There is an overwhelming (over half) sparing potential in the structure area and in this way it is considered as a potential division to address the difficulties of worldwide energy request and environmental change. Alongside the appearance of energy productive measures, increasingly successful methods are expected to prompt or propel more prominent endeavors, particularly to the signatories of the Kyoto Protocol. This specialized paper features the significance of reasonable development, talks about job of energy proficiency in green structures in Indian

setting to decrease the energy utilization and natural corruption through Green House Gas discharge (GHG). Likewise it indicates out the advantages of green development just as the motivating forces from govt. what's more, city bodies for GRIHA ensured green structure.

**2. 5. Avinash Shivajirao Pawar, Solapur University, Solapur, India Journal of Engineering Research and Studies E-ISSN0976-7916**

The Kyoto convention binded the created nations to diminish the ozone depleting substance emanations in any event by 5% by 2008– 2012 so as to handle a dangerous atmospheric deviation and environmental change. A portion of the proportions of the legislatures to accomplish this objective are to advance new structures development and to retrofit existing structures while fulfilling low energy criteria. This implies improving energy proficiency of structures and energy frameworks, creating feasible structure ideas and advancing sustainable power sources. "Green" or "feasible" structures utilize key assets like energy, water, materials, and land more productively than structures that are simply worked to code. With progressively common light and better air quality, green structures ordinarily add to improved representative and understudy wellbeing, solace, and efficiency. A green structure drains the regular assets to the base amid its development and task.

The point of a green structure configuration is to limit the interest on non-sustainable assets, expand the use proficiency of these assets, when being used, and augment the reuse, reusing, and use of inexhaustible assets. It boosts the utilization of proficient structure materials and development rehearses; streamlines the utilization of on location sources and sinks by bi-climatic building rehearses; utilizes least energy to control itself; utilizes productive gear to meet its lighting, cooling, and different needs; augments the utilization of inexhaustible wellsprings of energy; utilizes effective waste and water the board rehearses; and gives agreeable and clean indoor working conditions. In aggregate, the accompanying parts of

the structure configuration are investigated in a coordinated path in a green structure.

**3. J.T. Kevern, AM.ASCE, ASCE Journal of Professional Practice in Engineering Education and Practice Special Edition on Sustainability Education in Civil and Environmental Engineering**

This paper examines a structure to join maintainable plan/thinking as another Civil Engineering course and encounters from the pilot advertising. Imperative zones are plot to help all designers in understanding maintainability in setting with conventional building standards. Green structure rating frameworks were used to present the ideas of manageability in structures and foundation, featured by introductions from green structure experts. By giving a superior comprehension of supportability through instruction, Civil Engineers can give proactive answers for a developing worldwide framework.

### III. OBJECTIVES FROM THE PAPERS

Targets:

1. To examination the plan method for green structure.
2. To applying gravity loads and diverse load combinations according to Indian code arrangement.
3. To plan of Residential building (G+1) for an alternate instance of load combination
4. To Modify the structure and diminish the expense and make it condition neighbourly. must be indented. All paragraphs must be justified, i.e. both left-justified and right-justified.

### IV. REFERENCES

- [1]. G.R.K.D. Satya Prasad "Performance optimization of a Rooftop Hybridized Solar PV-AC grid assisted power system for peak load

- management” published in International Journal of Engineering Research and Applications, ISSN: 2248-9622, vol-2, Issue No-3, May-june 2012
- [2]. G.R.K.D. Satya Prasad “Design Of Standalone hybrid Biomass & PV system of an off grid house in a remote area” in International Journal of Engineering Research and Application, vol-3, issue-6, Nov-Dec 2013 , pp-433 - 437
- [3]. G.R.K.D. Satya Prasad “Energy and Comfort Management in Energy Efficient Buildings Using RETSCREEN Software-A Case Study Analysis” in International Journal of Engineering Research and Application ISSN: 2248-9622, Vol. 3, Issue 6, Nov-Dec 2013, pp.378-381
- [4]. <http://www.epa.gov/greenbuilding/pubs/about.html>.
- [5]. Yan Ji and Stellios Plainiotis (2006): Design for Sustainability. Beijing: China Architecture and Building Press. ISBN7112083907.
- [6]. Hopkins, R. 2002. A Natural Way of Building. (<http://transitionculture.org/articles/anaturalwayofbuilding2002/>) Transition Culture. Retrieved:20070330.
- [7]. Allen & Iano, 2008[Allen, E, & Iano, J. (2008). Fundamentals of building construction: materials and methods. Hoboken, New Jersey: John Wiley & Sons Inc.
- [8]. U.S. Environmental Protection Agency. (October 28, 2010). Green Building Home. Retrieved November 28, 2009
- [9]. Unnikrishna Pillai and Devdas Menon, “Reinforced Concrete Design”, Tata +McGraw-Hill publishing company limited.
- [10]. N.Krishna Raju, “Advanced Reinforced concrete design”, CBS publishers & distributors, Delhi
- [11]. SP:16-1980 “Design aids Reinforced Concrete” to IS:456-1978, Bureau of Indian Standards, New Delhi.
- [12]. Bribian, I.Z.; Capilla, A.V.; Uson, A.A., 2011: Life cycle assessment of building materials: Comparative analysis of energy and environmental impacts and evaluation of the eco-efficiency improvement potential. Build Environ 46: 1133-1140, 11. <http://dx.doi.org/10.1016/j.buildenv.2010.12.002>.
- [13]. Buchanan, A.H., 2006: Can Timber Buildings Help Reduce Global CO2 Emissions? Proceedings, World Conference on Timber Engineering. Portland, Oregon, USA.
- [14]. Buchanan, A.H., 2010: Energy and CO2 advantages of wood for sustainable buildings. Proceedings, World Conference on Timber Engineering. Riva-del-Garda, Italy.
- [15]. IS – 456:2000. Bureau Of Indian Standards Code Of Practice For Plain And Reinforced Concrete.
- [16]. ETABS Non Linear Version 9.2.0,
- [17]. [www.csiberkeley.com](http://www.csiberkeley.com)
- [18]. [www.Bentley.com/STAAD](http://www.Bentley.com/STAAD)