

INTRODUCTION TO GREEN BUILDING CONSTRUCTION IN INDIA

Ankit Yadav*¹, Adarsh Singh*², Arun Kumar Verma*³, Ashok Kumar Verma*⁴,
Ashutosh Kumar*⁵, Er. Shubhendu Mishra*⁶, Er. Om Prakash Pal*⁷

*^{1,2,3,4,5}U.G. Students, Department Of Civil Engineering, Goel Institute Of Technology & Management,
Lucknow, Uttar Pradesh, India.

*^{6,7}Assistant Professor, Department Of Civil Engineering, Goel Institute Of Technology & Management,
Lucknow, Uttar Pradesh, India.

ABSTRACT

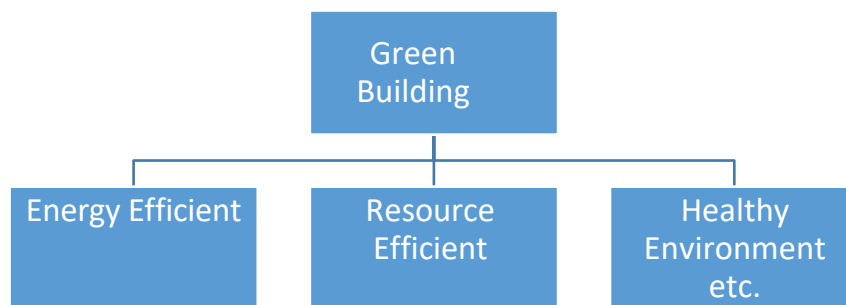
In this technological world, when the construction industry is expanding its avenues in developing countries where the peoples are expecting a good quality standard of living, there is the need of sustainable approach for clean & green environment. We all know the fact that the earth annual temperature is increasing at an alarming rate. Not only this, there are different types of pollutions that are taking our world to the path that has a deadly end. Air pollution, Noise pollution, Soil pollution, Green house emissions, Ozone layer depletion, Water pollution, Tsunamis, Global warming these are some of the main cause which are responsible in running our mother nature, our earth. To control these causes, we have to immediately take serious steps with proper law enforcements to tackle this. In past few years, the green construction or green building construction has emerged in the construction industry and taking a proper shape. Green construction is the new trend of this era. Green buildings greatly differ from conventional buildings and cause less effect on the environment.

Keywords: Green Building, Green Building Construction, Green Construction.

I. INTRODUCTION

Frugality is the major factor in any type of construction work, especially for domestic houses and more specifically when they're positioned in the municipality in a developing country like India. There's a need of concentrating on a green home, which is one of the most important and one of the most bandied motifs throughout the globe, in the age of global warming and climate change.

In this situation, some middle way is necessary to be plant out, to encourage the green construction. A green structure is one which uses low water, optimize energy effectiveness, conserves natural coffers, generates low waste and provide healthier spaces for inhabitants, as compared to conventional structures. Recently constructed green structures can have tremendous palpable and impalpable benefits. The palpable benefits include the reduction in water and energy consumption. Energy saving may range from 20% to 30% whereas water saving ranges from 30% to 50%. The impalpable benefits of the recently constructed green structure include enhanced air quality, excellent day lighting, health & well-being of the inhabitants, safety benefits and conservation of scarce public coffers.

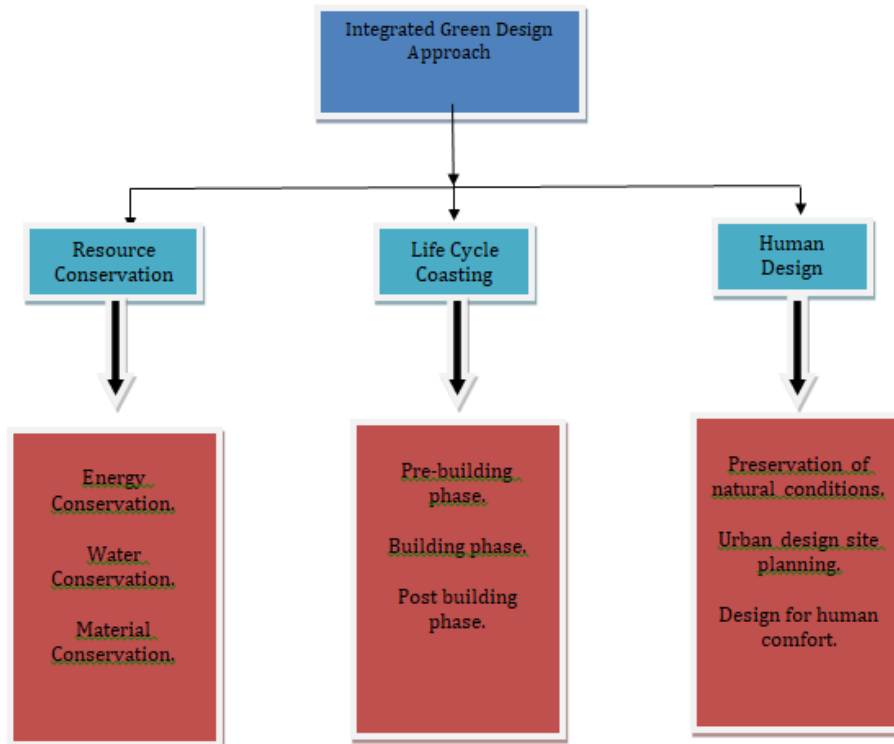


Flow Chart 1.1: Green Building Benefits

II. METHODOLOGY

Green structure styles describe a series of processes that minimize the environmental impact that a structure has throughout its life, from original design through to eventual dereliction or obliteration. Crucial focuses of green structure styles are the use of natural, recycled and sustainable structure accoutrements; effective designs and use of water and power systems; reduction in pollution and waste; and minimizing damage to the original ecosystem during and after construction.

This requires close cooperation of the contractor, the engineers, the masterminds, and the customer at all design stages. The Green Building practice expands and complements the classical structure design enterprises of frugality, mileage, continuity, and comfort. In doing so, the three confines of sustainability, i.e. earth, people and profit across the entire forced chain needed to be considered.



Flow Chart 2.1: Integrated Green Design Approach

Green Building Rating System In India

Green structure is a LEED –Certified (Leadership in Energy and Environmental Design) structure. LEED is established by the U.S. Green building Council (USGBC), the association promoting sustainability through green structures. LEED is the standing system development for certifying Green Structures and for assessing the structures performance against certain fixed criteria. Presently, India has 2190 LEED registered structures and 398 LEED certified structures with 1.27 billion sq. bases buildup area. Now how to get the LEED instrument the structure design must has to get them rated from the standing agencies. The three main standing systems for Green Structures in India are:

1. IGBC
2. GRIHA
3. BEE

Indian Green Building Council (IGBC)

Indian Green Building Council (IGBC) has certified the LEED Green Building Standard from the U.S. Green Building Council and is responsible for furnishing the LEED certificate in India. Giving a detail of IGBC . IGBC is formed by Confederation of Indian Industry (CII) in 2001 and is designedly doing to promote eco-friendly conception in the Indian assiduity. IGBC is a non-profit exploration institution having its services in CII-Sohrabji Godrej Green Business Centre, which is itself a LEED certified Green Structure standing in India. Since also the Green Building movement in India has boost up and get the recognition.

Green Rating for Integrated Habitat Assesment (GRIHA)

GRIHA is India’s self standing system developed by TERI and Ministry of New and Renewable Energy, GOI. The standing process begins with the online submission of documents as per the specified criteria followed by onsite visit by a platoon of professionals from GRIHA Secretariat. GRIHA standing system consists of 34 criteria distributed in four different sections:

1. Point selection and point planning

2. Conservation and effective application of coffers
3. Structure operation and conservation
4. Innovation

Bureau of Energy Efficiency (BEE)

Bureau of Energy Efficiency of India is an agency under the Indian Ministry of power. The primary end of the agency is to reduce energy intensity in Indian frugality by developing, planting and adding public and commercial mindfulness about energy conservation measures and practices. The association coordinates energy effectiveness and conservation programs and establish system and procedures to measure, cover and corroborate energy effectiveness results in individual sectors as well as at a macro position. Freak focuses on eleven artificial sectors, which are aluminium, cement, chemicals, coalmine, fertilizer, furnaces, HVAC, automobile, petrochemical, steel and textile.

Leadership in Energy and Environmental Design (LEED)

LEED is established by the U.S. Green building Council (USGBC), the association promoting sustainability through green structures. LEED is the standing system development for certifying Green Structures and for assessing the structures performance against certain fixed criteria. Presently, India has 2190 LEED registered structures and 398 LEED certified structures with 1.27 billion sq. bases buildup area. Now how to get the LEED instrument the structure design must has to get them rated from the standing agencies. The six LEED categories are:

- 1) Sustainable sites
- 2) Water efficiency
- 3) Energy and atmosphere
- 4) Innovation in design
- 5) Indoor environment quality
- 6) Resources and materials

III. ANALYSIS

Table 3.1: Comparison between ordinary buildings v/s green building.

Parameters	Conventional building	Green building
Walls	9"th (230mm) brick wall or 8"th (200mm) concrete block wall or 6"th (150mm) wall with FSC (Forest Stewardship Council) certified wood	AAC (Autoclave Aerated Concrete) blocks or cellular concrete blocks or cavity walls using rigid insulation using fly ash bricks. These blocks have low density and are light weight
Roofing	10"th (250mm) flat slab without any beam or 5"th (125mm) RCC slab (Reinforced Cement Concrete) with beam	Roof with minimum of 3" in (75mm) over deck rigid insulation
Roof protection	Conventional water proofing	Membrane water proofing topped with light colored china mosaic tiles or high albedo roof finish which roof reflective paints to reduce urban heat island effect
Flooring	Floor Tiles	Local stone/Bamboo/recycled tiles/Earthen flooring
Facade Glazing	High quality tinted glass glazing	Double glazed units with selective coatings with low heat transfer and high light transmittance

Interior Lighting	Tube lights and CFL lightings	T-5 or T-8 tube lights with dimmer controls and daylight sensors
HVAC (Heating, Ventilation and Air conditioning)	Chiller water plant, AC plant in lower floors with AHU,s (Air Handling Units) on each floor	AHU with large face area with increased air intake, outside air economizer, Carbon dioxide sensor based for fresh air system
Water efficiency	Conventional system with recycling water system	100% on site water treatment, usage of non-potable water for landscaping, gray water for toilet flushing, rain water harvesting and water efficient fixtures
Chillers	Regular chillers without any dust control and without automation	Variable Frequency Drive(VDF) chillers With high Co-efficient of Performance (COP)
Fire suppression	Water sprinklers	No halogen or other CFC's (chlorofluorocarbon) are used in fire suppression system
BMS (Building Management System)	Typical basic system	Intelligent BMS with high degree of automation with separate meter controls for end user
Building Orientation	As per site/design without no particular consideration for sunlight and ventilation	Lesser surface area are exposed to east or west direction. Shading of facades and glazing, over hangs are used as design features
Redevelopment	Reused sites are not often used due to lack of site features	Rehabilitated damage sites, known as Brown field redevelopment is ideally suited for green building construction.

IV. CONCLUSION

Green buildings are next-gen buildings. The future of building is green buildings. It works on the principle of sustainability. In next 20-30 years the pollution level and other environment threatening hazards may grow, so to prevent this condition we should have work hard in present time and using the resources in a sustainable way , only then we should be able to make a bright future for our upcoming generations. Green buildings are one of them. They help sustain life and provide a better future for next generation. In now days Green building construction has takes steps in India and variety of Green Building constructions were take place or either they are in under construction.

In conclusion we can say that Government Subventions along with the concern for terrain due adding mindfulness about the demanding terrain pollution will have a positive impact in creating the demand for green structures. People should be made apprehensive of the demeaning terrain being due to rise in concrete structures constructions and depleting trees. If we see the construction statistics of the last decade, sustainable measures if not taken incontinently for unborn structure construction may drastically increase the position of environmental pollution.

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