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Living Green: Integration Nature into Architecture

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Abstract: The term " Living Green: Integration Nature into Architecture " is used to describe buildings that are designed, constructed, and operated, to have a minimum impact on the environment, both indoor and outdoor. Most discussions of green buildings refer to the importance of providing an acceptable, if not exceptional, indoor environment for the building occupants. However, these discussions of indoor environment quality have not included many specific recommendations or criteria for building design, construction, or operation. Building projects described as green building demonstrations often make reference to indoor air quality, but these references are often general and qualitative. In addition, rating systems that have been developed to assess the "greenness" of a building are based largely on design features and are not particularly specific with respect to indoor air quality. This paper reviews the features of indoor air quality that are considered in green building discussions, demonstration projects, and rating systems. These green building features are discussed in terms of their completeness and specificity, and are compared to other guidance on building design, construction, and operation for good indoor air quality. A case study of indoor air quality performance in a green building is presented. This study includes a description of the indoor air quality features of the building and the results of a short-term indoor air quality evaluation of the building involving ventilation and contaminant concentration measurements.

INTRODUCTION

A “Living Green: Integration Nature into Architecture” is a building that, in its design, construction or operation, reduces or eliminates negative impacts, and can create positive impacts, on our climate and natural environment. Green buildings preserve precious natural resources and improve our quality of life.

There are a number of features which can make a building ‘green these include:

- Efficient use of energy, water and other resources.
- Use of renewable energy, such solar energy. As
- Pollution and waste reduction measures, and the enabling of re-use and recycling.
- Good indoor environmental air quality.
- Use of materials that are non-toxic, ethical and sustainable.
- Consideration of the environment design, construction and operation.
- Consideration of the quality of life of occupants design, cons instruction and operation
- A design that enables adaptation to a changing environment.

Any building can be a green building, whether it’s a home, an office, a school, a hospital, a community centre, or any other type of structure, provided it includes features listed above. However, it is worth noting that not all green buildings are – and need to be - the same. Different countries and regions have a variety of characteristics such as distinctive climatic conditions, unique cultures and traditions, diverse building types and ages, or wide-ranging environmental, economic and social priorities all of which shape their – approach to green building. This is why World GBC supports its member Green Building Councils and their member companies in individual countries and across regions, to pursue green buildings that are best suited to their own markets.

1. METOODOLOGY

This study is aimed at research, study and development of the green building construction techniques in order to save our planet from pollution and global temperature rise. Also, it aims at spreading awareness among the people all over the world, about the advantages and also the long term cost savings from green buildings. Further, the structural methodology is structured as below:

1. Introduction
2. Literature survey
3. Study of the research topic in detail
4. To study the research papers, articles and magazines related to the topic of study.
5. Data collection from the proposed areas of study which includes large, medium and small scale construction projects.
6. Collection of information with the help of web surveys.
7. Finding out new ways and techniques for development of green construction.

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1.1 FUNDAMENTALS LIVING GREEN INTEGRATION NATURE INTO ARCHITECTURE

There are five fundamental principles of Living Green Integration Nature into Architecture:

1. Sustainable Site Design
- Create minimum urban sprawl and prevent the needless destruction of valuable land, habitat and open space.
- Encourage higher density urban development a means preserve as to evaluable green space.
- Preserve key environmental assets through careful examination of each site.

2. Water Quality & Conservation
- Preserve the existing natural water cycle and design the site so that they closely emulate the site's natural hydrological systems.
- Emphasis on retention of stormwater and on-site infiltration well ground water as recharging.
- Minimize the inefficient use of potable water on the site while maximizing the recycling and reuse of water, including rainwater harvesting, stormwater, and grey water.

3. Energy & Environment
- Minimize adverse impact the environment through optimized building siting & design, material selection, and aggressive use of energy conservation measures.
- Maximize the use of renewable energy and other low impact energy sources.
- Building performance should exceed minimum International Energy Code (IEC) compliance level by 30-40%.

4. Indoor Environmental Quality
- Provide a healthy, comfortable and productive indoor environment for building occupants.
- Utilize the best possible conditions terms in of indoor air quality, ventilation, and thermal comfort, access to natural ventilation and day lighting.

5. Materials and Resources
- Minimize the use of non-renewable construction materials through efficient engineering and construction, and effective recycling of construction debris. Maximize the use of recycled materials, modern energy efficient engineered materials, and resource efficient composite type structural systems as well as sustainably managed, biomass materials.

1.2 CHARACTERISTICS LIVING GREEN INTEGRATION NATURE INTO ARCHITECTURE

- Water efficiency:

To minimize water consumption one should aim use the water which to has been collected used purified and reused.

- Energy efficiency:

The layout of the construction can be strategized so that natural light pours for additional warmth. Shading the roof with trees offers an eco-friendly alternative to air condition.

- Renewable energy:

Solar energy could be utilized for a variety of purposes and in a number of ways generating electricity, providing hot water, and heating, cooling, and lighting buildings.

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• Material efficiency:

Material should be use that can be recycled and can generate surplus amount of energy.

1.3 STEPS IN CONSTRUCTION OF LIVING GREEN INTEGRATION NATURE INTO ARCHITECTURE

The following Seven Steps to Living Green Integration Nature Into Architecture will provide you with a guide to make your home Green by Design.

Step1. Assess Your Needs.

Step2. Form a Team.

Step3. Design for Your Conditions.

Step4. Choose Green Materials.

Step 5.Choose the Right Mechanical Systems.

Step6. Get Maximum Benefit from Your Site and Landscape.

Step7. Test and maintain.

1.4 MATERIAL AND ELEMENT

1. Recycled Plastic: Rather than sourcing, mining and milling new components for construction, manufacturers are using recycled plastic and other ground-up trash to produce concrete. The practice is reducing greenhouse gas emissions and is giving plastic waste new use, rather than clogging landfills and contributing to plastic pollution. A blend of recycled and virgin plastic is also used to make polymeric timbers, for use in making fences, picnic tables and other structures, at the same time, saving trees. Plastic from two-liter bottles can be spun into fiber for the production of carpets. Reused plastic can also design products such as cable pipes, roofs, floors, PVC manholes, and PVC windows.

2. Reclaimed Wood: Using reclaimed wood is one of the most environmentally responsible ways to save trees and reduce the amount of lumber in landfills. Reclaimed wood can be found in retired barns, excavation companies, home remodelling contractors and companies, salvage yards, and shipping crates and pallets. Reclaimed wood is good for structural framing, cabinetry, and flooring. It is lightweight but has less strength and each piece's integrity should be assessed and chosen for an appropriate project. Also, most wood is susceptible to insects and degradation, meaning it needs reinforcement and additional treatment.

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3. Solar shading : Solar control and shading directly impact on the energy efficiency of the building. The cooling load can be minimized to one-fourth of the building's load. Shading devices such as fins and chajjas (overhangs) are designed to get a minimum exposure of the sun in summer while allowing the winter sun inside the space. This helps in regulating and reducing the electrical load on the building. Solar orientation is important to consider while designing an effective shading device. Some solar shading elements can be trees, hedges, overhangs, vertical fins, low-shading coefficient glass, blinds, and louvers.

4. Building material choices : Material selection for the building's construction plays a crucial role in deciding its impact on the environment. Locally available materials that are non-toxic and sustainable should be selected for the construction to reduce the environmental impact of transportation. Recycled materials can also minimize waste products from the environment. UV-reflective paints can be used on the exterior walls to reduce the heat gain of the building. Material on the roof also plays a major role in the energy efficiency of the building. China mosaic white finish, vermiculite concrete, and polystyrene insulation are some materials that can be used as a roofing material. The lighter the color of the material used on the roofs, the lesser the heat gain for the building.

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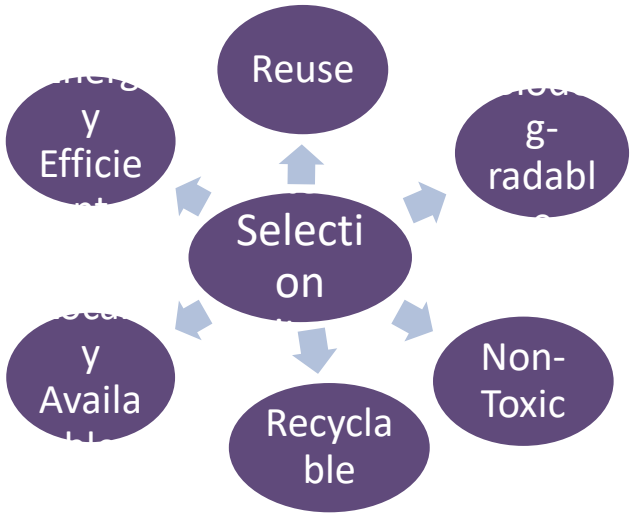

5. Window-wall ratio (WWR) : The Window-wall ratio is the ratio of the window area to the exterior wall area of the facade. It is an important value in determining the energy performance of the building. Since windows cause energy loss twice more than the wall, it has impacts on heating, cooling, lighting, and Ventilation. Thus, the size and number of windows should be designed according to the climatic conditions. Besides, interior and exterior shading, along with high-performance glazing systems can reduce the undesirable solar heat gains through the windows & O.T.S Provided.

6. Waste management: Waste management is required to reduce the burden of waste generated by the residents to the landfills. It is done by implementing, by reducing, recycling, and reusing the waste generated by the building. Therefore, initial planning is required for dedicated space requirements during early design stages.

The generated waste needs to segregate on-site as degradable and non- degradable. Therefore, wastewater collection systems and plumbing systems are required to be well-thought and well-designed. The construction stage is the one where all the waste management strategies are implemented. Sufficient site accommodation is required for the waste and recycling systems.

1.5 CONCLUSION

- Nowadays, we should make a way to maximize our natural resources and also help our mother earth to get some relief since pollution is everywhere plus the global warming that we are all experiencing.
- Non-renewable energy is expensive and unsafe but did you know that through green building we can save a lot of energy.
- Before that, let's define first the meaning of green building (known also as green construction is the practice of creating structures and using processes that are environmentally responsible and resource efficient throughout a building's life-cycle: from siting to design, construction, operation, maintenance, renovation, and deconstruction.
- The importance of this is it lessen the consume of energy and the pollution as well because the more we use non-renewable energy the higher the risk of pollution.
- The differences in green and normal building are the "Green Buildings" are more environment friendly as they help in resources conservation Also the initial cost may be higher but they prove in be economical in long run. Due to this advantage, it is predicted that in 2 or 3 years there will be the 10% of the buildings will be green.
- Green building - high performance building increases the efficiency with which buildings and their sites use and harvest energy, water, and materials.
- Green building brings together a vast array of practices, techniques, and skills to reduce and ultimately eliminate the impacts of buildings on the environment and human health.
- The Green Building' concept is gaining importance in various countries, including India these are buildings that ensure that waste is minimized at every stage during the construction and operation.

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