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Green Design Parameters in High Rise Building in Hot Humid Climate

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Abstract: ***The term "green building" 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 Project 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 adscription 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.

Keywords: Ecological, Green, Design, Sustainability, Natural Ventilation.

I. INTRODUCTION

Green building (also known as green construction or sustainable 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, construction, operation, maintenance, renovation, and demolition. This requires close cooperation of the contractor, the architects, the engineers, and the client at all project stages. The Green Building practice expands and complements the classical building design concerns of economy, utility, durability, and comfort. Green building, or sustainable design, is the practice of increasing the efficiency with which buildings and their sites use energy, water, and materials, and of reducing impacts on human health and the environment for the entire lifecycle of a building. Green-building concepts extend beyond the walls of buildings and include site planning, community and land-use planning issues as well. The growth and development of our communities has a large impact on our natural environment. The manufacturing, design, construction and operation of the buildings in which we live and work are responsible for the consumption of many of our natural resources.

II. OBJECTIVES

1) To achieve sustainable building. energy & resources efficient (Including greenhouse gas emission education.)
2) To study the desirable thermal condition in green building in hot humid Climate.
3) To design the Parameter for the hot & humid climate.
4) To validate the indoor temperature effortlessly by using various material for controlling temperature in hot humid climate.

III. METHDOLOGY

The study of this thesis is carried out as a minor field study within the fields of sustainable development in built environment. The study is done in close collaboration with several organizations based in Dar es Salaam, Tanzania, beginning with Ardhi University, School of Architecture and Design.

A. Consider Installing an Air Conditioning System

1) Air conditioners enhance the cooling in your home throughout the summer

2) Providing a refreshing breeze and ensuring a comfortable environment for rest.
3) Integrating an innovative air conditioning unit allows you to manage your indoor temperature effortlessly.

B. Choose UV-Deflecting Glass for Your Windows

1) The window is equipped with a low e-coating, which effectively reflects UV light and selectively permits the passage of the visible spectrum.
2) This innovative feature allows natural light to enter your space while preventing excessive heat buildup

C. Solar Tracking

1) When planning the design of your home, it is essential to carefully assess how sunlight angles impact various areas of your house.
2) This aspect holds significant importance in ensuring optimal cooling of your property.
3) Typically, the eastern side of your home receives gentle morning sunlight, providing a refreshing and invigorating ambiance without excessive heat buildu.

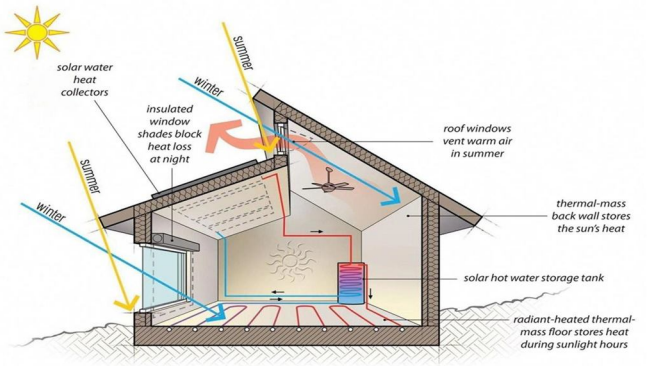

Fig No 1. Solar Tracking

D. Improve Ventilation

1) Enhancing airflow in your home is crucial for maintaining a fresh and comfortable environment.
2) Consider installing exhaust fans or air filtration systems in critical areas such as the kitchen, bathroom, or laundry.
3) These devices eliminate humid or stagnant air, promoting continuous fresh air circulation throughout the space.

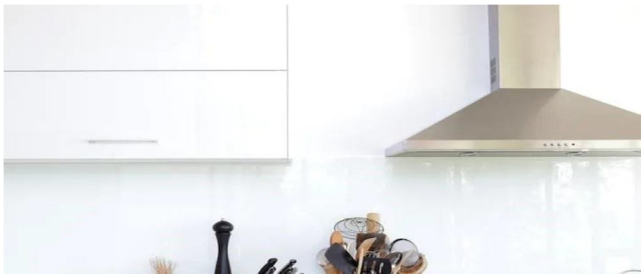

Fig No 2. Ventilation at kitchen

E. Select the Right Building Materials

Choose your building materials wisely in designing your home for the hot climate. It should minimize heat gain and protect against moisture and heat damage. Below are some tips to consider:

1) Use waterproof roofing materials such as asphalt shingles, Spanish tiles, and slate that don't heat up fast.
2) Set up vapor barriers, house wraps, and permeable indoor wall coverings to protect your home from moisture.

F. Opt For Greenery

1) You can bring houseplants such as orchids, peace lilies, ferns, rubber plants, and palms to help cool your home in a hot climate.
2) When temperatures rise, plants release excess water into the air from their leaves. This evaporated water cools the plants and the surrounding environment.

3) You can group them to create a little atmospheric ecosystem that effectively replenishes moisture in the air.

Fig No 3. Greenery

IV. RESULT

1) The project aimed to address Green building parameter in high rise building in hot humid climate concerns associated with construction activities by implementing effective building Parameter. This summary outlines the through the project's efforts key results achieved.
2) Implementation of effective Green building parameter, such as high-rise building, led to noticeable improvements in building parameter.
3) Reductions in high-rise building, have contributed a healthier environment for workers and surrounding communities.
4) Coordination with construction managers, contractors, and subcontractors ensured timely deployment of control measures and effective resource management
5) Establishment of monitoring protocols enabled the project team the effectiveness of Green building parameter and track progress over time.
6) Regular inspections, climate measurements, and data analysis provided valuable insights into the project's impact on climate quality to maintain improvement
7) Using Green building parameter, the environment in the house would be stable and in the hot humid climate it will control the humidity.

V. CONCLUSION

Achieving sustainable building energy and resource efficiency while reducing greenhouse gas emissions requires a multifaceted approach: integrating advanced insulation, high-performance windows, and efficient lighting and HVAC systems; investing in on-site renewable energy sources like solar, wind, and geothermal; using sustainable, low-embodied energy materials; implementing water- saving fixtures and rainwater harvesting; adopting smart building technologies for real-time energy optimization; adhering to sustainable design standards such as LEED or BREEAM; educating occupants on energy-saving behaviors; and advocating for supportive policies and financial incentives. Together, these strategies can significantly reduce environmental impact and promote a more sustainable built environment.

Studying desirable thermal conditions in green buildings within a hot, mid-climate is essential for enhancing occupant comfort and energy efficiency. By analyzing factors such as insulation, ventilation, thermal mass, and the use of reflective or green roofing, we can determine the most effective strategies to maintain optimal indoor temperatures. Implementing passive cooling techniques, such as shading, natural ventilation, and the strategic placement of windows and vegetation, can significantly reduce reliance on air conditioning. This Not only improves comfort but also decreases energy consumption and greenhouse gas emissions, contributing to the overall sustainability and performance of green buildings in hot climates.

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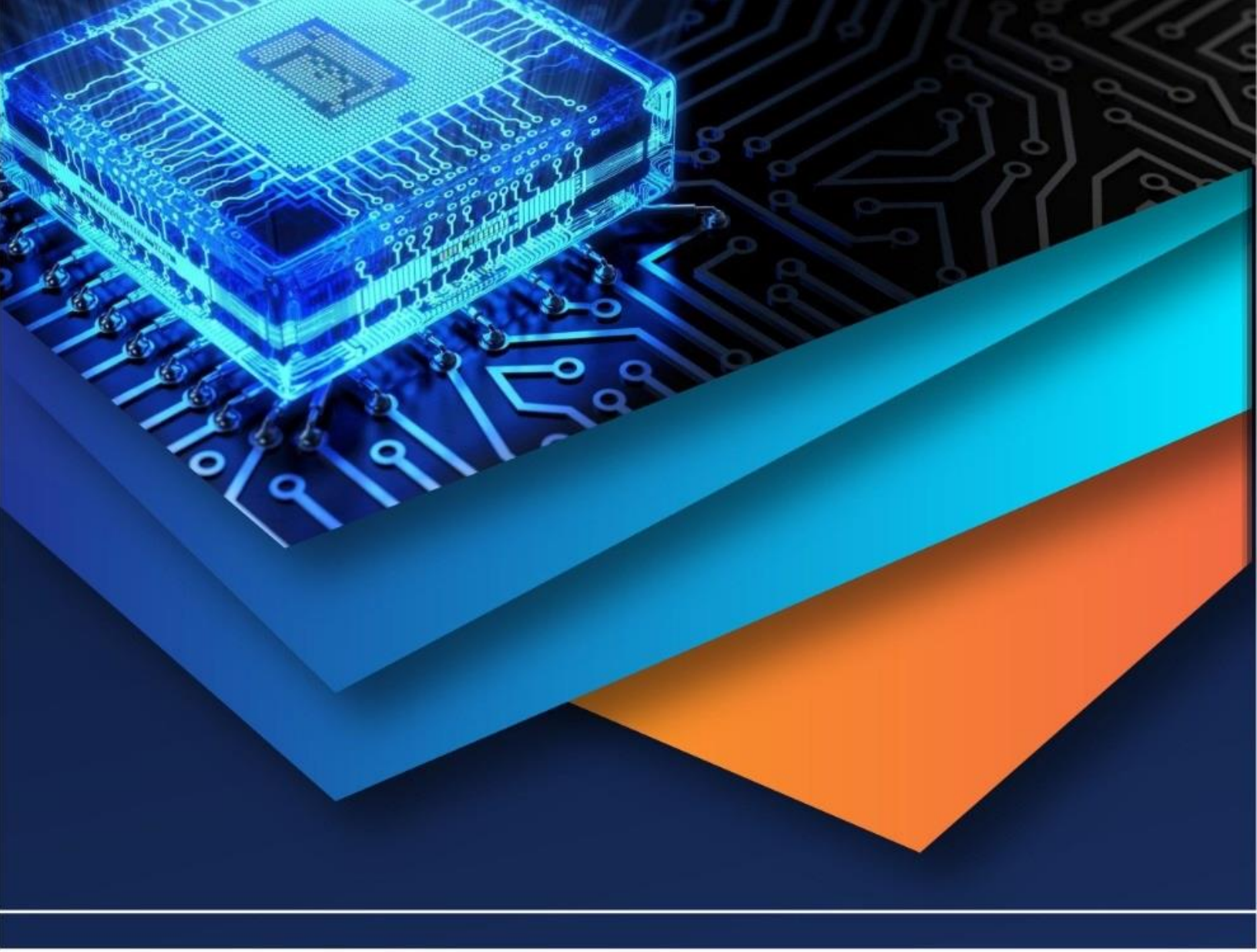

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